SOCIAL SCIENCES

Science and Socialism

Socialist Democracy and Production in the USSR

Geographical Sciences Today

Quantitative Methods in Historical Research

Artificial Intelligence

A Unique Experiment by Soviet Psychologists

2

1976

USSR ACADEMY OF SCIENCES

A quarterly of the Section of the Social Sciences, USSR Academy of Sciences. Founded in 1970. Published in Moscow in English, and also in French, Sciences Sociales; *in German,* Gesselschaftswissenschaften; *and in Spanish,* Ciencias Sociales

The journal is published by agreement:

in Bengali,
Samaj Bijnan (Bingsha Shatabdi Publishers, Calcutta, India);

in Japanese,
Shakai Kagaku (Nara-Eiwa Shoji Co., Ltd., Nara, Japan);

in Greek,
Kinonikes epistemes (Planet Publishers, Athens, Greece);

in Arabic,
Al Ulum al-Ijtima'iya (Dar al-Farabi Publishers, Beirut, Lebanon),

and reprinted in Argentina by Anteo Publishers, Buenos Aires,

For subscriptions apply to national distributors dealing with V/O "Mezhdunarodnaya Kniga" that are listed at the end of this issue.

"Social Sciences" Editorial Office, 33/12 Arbat, Moscow 121002, USSR

USSR ACADEMY OF SCIENCES

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SOCIAL SCIENCES

Vol. VII, No. 2, 1976

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To the Reader

This issue went to press when the CPSU Central Committee published the draft "The Main Directions in the Economic Development of the USSR for 1976-1980" for the 25th Congress of the CPSU. The draft notes that "the main task of the Tenth Five-Year Plan is the consistent implementation of the policy of the Communist Party aimed at improving the people's material and cultural standards of life, based on the dynamic and proportional progress of social production and enhancing its effectiveness, on the acceleration of scientific and technological progress, on labour productivity growth and a great improvement of work quality throughout the national economy."

A great deal of attention is paid to the role of science in the progressive movement of society. The draft emphasises that the principal task for Soviet scientists is to expand and deepen their research into the laws of nature and social life, to increase their contribution to solving urgent problems in building up the material and technical foundation of communism, speeding up scientific and technological progress and the effectiveness of production, to improve the people's culture and well-being, and to develop working people's communist outlook.

The Central Committee of the Communist Party of the Soviet Union stresses the need to ensure further development in fundamental and applied research in the social, natural and technical sciences; to concentrate the attention of scientists on major problems connected with scientific, technological and social progress, on the solution of which largely depends the successful development of economy, cultural and scientific progress; to envisage the further research which opens new ways and possibilities for transforming the country's production forces, for developing the machinery and technology of the future; to strengthen the relationship between the social, natural and technical sciences.

The draft defines the following major directions of research development in the social sciences:

to carry on with the scientific generalisation of the world historic experience of the CPSU; to examine the theoretical problems of developed socialism, the law-governed trends of its development into communism and the mechanism of their operation and utilisation; to continue to develop the theory of building-up the material and technical foundation of communism, improving social relations, moulding the new man, and developing the socialist mode of life; to promote research on the problems of the scientific and technological revolution, of raising the effectiveness and intensification of social production, of improving management and economic planning, and also of forecasting social and economic processes; to extend research on the development of the socialist economic integration of the USSR and the CMEA countries, on economic relations with other states, and of contemporary world development.

Our journal will systematically acquaint its readers with Soviet social scientists' work in this field. This year it will carry a series of articles on the improvement of management and economic planning, on the moulding of the new man, etc.

Science and Socialism

The 250th anniversary of the USSR Academy of Sciences has become a grand national occasion, an international demonstration of the achievements by Soviet scientists. "Socialism and science are indivisible," said Leonid Brezhnev at the celebration meeting devoted to the anniversary. In this issue you will find **Leonid Brezhnev's** speech in full, and our next issue will tell you more about the celebration meeting.

We reprint from the journal *Kommunist* a leading article which reviews the progress of the social sciences in the USSR and describes the main trends of research by Soviet scholars. The journal of the CC CPSU highly assesses the contribution made by the social sciences to the economy and culture of the USSR, to the moulding of the new man.

Economics. Management

An objective law of mature socialism is the enhancement of the role of the working people, of the factory collectives in the management of the economy. The article by **F. Rudich** analyses the processes of further improving the activities of democratic institutions already functioning in production and of evolving new forms of economic democracy.

Geography

In July-August 1976 Moscow will be the venue of the 23rd International Geographical Congress. We offer our reader several articles by representatives of the geographical sciences in this connection. Only recently geography was considered just a general educational discipline, a discriptive and cognitive science mainly. Not so now. Today geography has firmly taken its place among the fundamental sciences, has acquired the significance of an experimental and transforming science. One of its main functions has become comprehensive participation in resolving a problem crucial for mankind, namely, the rational utilisation of natural resources while preserving and improving the quality of the natural environment on Earth.

The main trends in Soviet geographical sciences, described by its representatives as "constructive geography" are: development of theory and elaboration of scientific programmes for the remaking of nature; creation of regional models for the most rational distribution of social production; study of the regularities of settlement and of ways of improving the network of inhabited localities with a view to creating the most favourable living conditions for people. These trends make the traditional division of geography into physical, economic and population antiquated. Characteristic of contemporary geography in the USSR as well as in other countries are, on the one hand, processes of differentiation and the formation of a whole system of disciplines and, on the other, their integration for tackling many problems in complex, the expansion of cooperation between geographers and representatives of other sciences, both natural and social.

The growing interest of scientists in geography is only natural for, as one of the authors on the subject writes, the integration processes in science are particularly clearly evident today precisely in geography which has become a kind of "proving ground" for the mutual fertilisation of the social and natural sciences.

History

J. Kahk, Corresponding Member of the Estonian Academy of Sciences, and **I. Kovalchenko**, Corresponding Member of the USSR Academy of Sciences, in their article examine some specific and general problems that arise when machine methods are applied in historical research, and substantiate the determinative role of the qualitative (general theoretical) approach in these studies.

With the invasion of Bessarabia in 1918 the forces of international imperialism launched their offensive against the young Land of Soviets. **V. Vinogradov** shows, on the basis of documentary material, the struggle of the working people of Bessarabia against its seizure by the Rumanian oligarchy which it carried out with the participation of two opposing imperialist groups, and with the support of the local and Russian counter-revolution.

On the basis of a collation of a wide range of archaeological data **L. Vasilyev** makes an attempt to assess the role the ancient cultures of Western Eurasia played in accelerating the evolution of Chinese civilisation.

Philosophy. Psychology

The scientific trend connected with the creation of an "artificial intellect" is leading to the formation of new interdisciplinary ties which await analysis. **O. Tikhomirov** essays such an analysis, beginning with an examination of the relations between the said trend and psychology.

For many years now much has been done in the Soviet Union to evolve educational aids for blind-deaf-mutes. In this issue we familiarise the reader with the results of a unique experiment carried out by Soviet scholars, which besides being of general psychological significance has wide philosophical implications, an experiment which enabled a group of four blind-deaf-mute students to receive a higher education. We print the texts of their reports made at the Academic Council of the Department of Psychology of the Moscow State University.

The Editors

Pride of Our Country's Science

LEONID BREZHNEV

Dear comrades,
Dear foreign guests,

Our Academy of Sciences is 250 years old. All Soviet people are observing the anniversary as an important cultural occasion, as a nationwide review of Soviet scientific achievements.

We see the anniversary of the Academy of Sciences as an event of nationwide importance, firstly, because in our country enlightenment and science traditionally enjoy profound respect and esteem. Secondly, because hitherto science has never, under any social system, enjoyed such, I would say, a decisive status in economic and social development as it does under socialism — and especially now that communism is being built. To us science today is a life-giving source of technical, economic and social progress, a source of growth for the culture of the people and of their well-being.

Therefore, it is with a feeling of great satisfaction that I fulfil the instructions of the Central Committee of our Party, the Presidium of the Supreme Soviet of the USSR and the Soviet Government to heartily and sincerely congratulate the hero of the day — the Academy of Sciences of the USSR, its members, and all Soviet scientists.

The Academy of Sciences can review these two and a half centuries of its history with pride. It has traversed a difficult, but truly glorious road. The Russian Academy of Sciences was born and worked in the difficult conditions of a despotic tsarist regime, in a country backward for many centuries, and where the ruling classes for the most part were indifferent to science and culture. The Academy, however, rallied all that was best, all that the scientific and

Speech by L. BREZHNEV, General Secretary of the CPSU Central Committee, at a celebration meeting on the occasion of the 250th anniversary of the Academy of Sciences, in Moscow, on October 7, 1975.

cultural life of the country could offer at the time, and learned from the experience of progressive Western scientists. Already in the 18th century its work was elevated to a new level by the titanic effort of Mikhail Vasilyevich Lomonosov, scientist and encyclopaedist, a man of genius who rose from the lower classes.

The great scientists N. Lobachevsky and D. Mendeleyev, A. Popov and I. Mechnikov, N. Pirogov and I. Sechenov, N. Zhukovsky and K. Tsiolkovsky, I. Pavlov and K. Timiryazev, V. Vernadsky and A. Bogomolets, I. Kurchatov and S. Korolyov have forever brought fame to their country's and world science. This honourable list of outstanding men whose immortal deeds have enriched civilisation, could be continued. By its work, the Academy of Sciences made an invaluable contribution to the development of science, culture and the enlightenment of all the peoples in our great country.

The powerful upsurge of the humanities, of progressive social thought in Russia largely took place outside the official framework of the pre-revolutionary Academy, but in close conjunction with the mainstream of development in science and culture. A. Radishchev and N. Novikov, V. Belinsky and A. Herzen, N. Chernyshevsky and N. Dobrolyubov, and G. Plekhanov, the pioneer of Marxian thought in Russia — all of them helped in the intellectual awakening of Russia, in moulding the peoples' revolutionary consciousness in our country. In the final analysis, their work helped to prepare the ground for the great feat achieved by Lenin's genius, for the creation of a revolutionary workers' and peasants' party, for the victory of the Great October Revolution.

Karl Marx, Frederick Engels and Vladimir Ilyich Lenin, the greatest revolutionaries and the greatest of scholars, having effected a revolution in social science, made science serve the revolution. As they had foreseen, the victory of the socialist revolution radically changed the position and role of science in society. Freed from tsarist oppression and capitalist enslavement, science became what its finest, most talented representatives had for centuries dreamt it might one day be — a powerful force for improving people's lives, for increasing their material and intellectual wealth. That is why many of the leading scientists in our country, who were subjectively remote from the Marxist ideology, heartily welcomed the victory of the October Revolution and supported the Soviet Government headed by Lenin. Under the guidance of the Communist Party, workers and scientists set out together on the unexplored road of building socialism.

Socialism and science are indivisible. This is one reason for the victory of socialism. For it was socialism that made it possible to use the gains of science for the people, to unfetter the creative potential, the talents that are so abundant in every nation. And only by drawing on all the latest developments in the sciences that deal with nature and society is it possible to successfully build socialism and communism.

So it was only natural that the young Soviet state and Lenin, its founder, showed special concern for scientists, for the conditions

under which they lived and worked. Lenin took a personal interest in defining the main trends of work of the Academy of Sciences and the forms of its participation in the fulfilment of the Party's plans for developing the country. Gradually, the Revolution changed the social aspect, the class composition of the Academy. Talented young workers and peasants, people of many of the country's different nationalities, came to its research institutes and laboratories. This constituted a valuable source of the Academy's replenishment.

Looking back over the past decades, comrades, we have good reason to say that Soviet scientists have justified the confidence and hopes of the Communist Party, the Soviet state and the Soviet people.

They took a very active part in drawing up the GOELRO plan—the first truly scientific long-range plan of national economic development. They took an active part in working out and implementing the first five-year plans of our socialist construction. Scientific advice was particularly valuable at that time because the young Soviet state was setting out on untrodden paths, with no other experience to draw on, no chance even of learning from the mistakes of others.

Soviet scientists helped to set up the basic branches of modern industry in the country. They helped to carry out the Leninist cultural revolution, to build up a new educational system for the people—general schools, workers' faculties, specialised secondary and higher schools, to create written languages for a number of the formerly backward peoples.

Comades, all these are components of the remarkable contribution made by our scientists, above all by the USSR Academy of Sciences, to building a socialist society. Neither the Party nor our people will ever forget it.

Both the tasks and opportunities of our science expanded and the whole organisation of scientific work in the country greatly improved. The Academy of Sciences did much to help to found and develop the leading specialised scientific centres, which were set up in our country by decision of the Party—the Academy of Medical Sciences, the Academy of Pedagogical Sciences, the Academy of Agricultural Sciences and the Academy of Arts of the USSR.

The active work under the leadership of the USSR Academy of Sciences to develop science in the Union Republics was a concrete expression of our Party's Leninist nationalities policy. Branches of the Academy grew into republican academies of sciences. Today one cannot speak of the achievements of Soviet scientists without mentioning the outstanding discoveries made by these splendid national detachments of our Soviet science.

The postwar years have seen a further development of this process: the Siberian branch of the USSR Academy of Sciences was set up and is now firmly established in world science. The Academy's science centres in the Urals and the Far East were formed and are doing good work.

There is one matter on which I wish to dwell specially—the Party spirit of our science. Whatever the field in which Soviet scientists are

working, they are always distinguished by one characteristic—communist consciousness and Soviet patriotism.

The truly Soviet scientist proceeds in his entire research work from the scientific ideology of Marxism-Leninism, is an active fighter for the cause of communism, against all forces of reaction and obscurantism. Our scientists subordinate all their practical work to the task of implementing the noble ideals of communism.

The Soviet scientist is always confident that his discoveries will serve lofty humane objectives. Our scientists made a tremendous contribution to the Soviet people's victory over nazi Germany. It was a contribution to the victory of reason, justice and peace over the forces of barbarity and aggression.

The development by Soviet scientists of a powerful modern weapon in answer to the warmongers' designs, ended the imperialists' nuclear monopoly and rendered our country's defences impregnable. This also helped strengthen the positions of peace forces all over the world and greatly multiplied the opportunities of our peaceful construction.

The great feat of Soviet science in developing space rocketry and in space exploration will live on for centuries. The enhancement of its economic and defence potential has enabled the Soviet Union to launch an active and successful peace "offensive" in the international arena.

Today, Soviet scientists are actively helping in many ways to solve the historic task of building a communist society in the Soviet Union, and helping in our common struggle to consolidate world peace.

The Communist Party, the Soviet state, all our people highly appreciate and, as you know, honour the work of the outstanding scientists who are now working under the aegis of the USSR Academy of Sciences and are the pride of modern Soviet science.

Comrades, we face tremendous tasks: to further develop every aspect of life of Soviet society—the economy, social relations and the people's consciousness—in the direction called for by our communist ideals, and on the basis of the latest achievements in science and technology. The Party has set a task of enormous importance, that of blending the achievements of the scientific and technological revolution and the advantages of socialism.

The 24th Congress of the CPSU and the subsequent Central Committee plenary meetings defined the main aspects of economic policy at the present stage and formulated new approaches to management and planning dictated by life. Modern trends in the Party's agrarian policy have been worked out carefully on a scientific basis and are being put into practice consistently.

A study of the present alignment of forces in the world arena has made it possible to formulate and successfully implement a comprehensive foreign policy programme, the Peace Programme.

Scientists and specialists in different branches of natural science, technology and in the social sciences have helped and are helping the Party extensively in coping with all these tasks, in drawing up and

carrying out plans, for which the Party renders heartfelt thanks to them.

Yet we need still more application, still more persistent and effective work. We have no intention of dictating to you the details of your research subjects, or how to go about them — that is a matter for the scientists themselves. But the main directions in science, the main tasks that are set by life itself, these we shall decide together.

As the Party prepares for its 25th Congress, it expects of scientists increasingly deep and daring research into new processes and phenomena, an active contribution to scientific and technical progress, a penetrating analysis of the problems that arise and responsible recommendations of the best ways of solving them in the interests of building up our country's strength, of improving the life of the people and in the interests of building communism.

We have reached the stage when we must decide the question of the general trends of further technical and economic advancement, must formulate a long-term strategy for scientific and technical progress. Building communism, we need to have as clear an idea as possible of the production machinery of a future society.

Naturally, it is difficult to do anything in this field without fundamental research. Scientists must visualise the machines of the future, and work to produce them.

At the same time, I would like to mention, as a highly gratifying fact, the growing direct contact between science and practical life, the daily contacts between research institutions and industry. Often research institutions now work on major technical problems directly by orders of factories and construction sites and, drawing on their know-how, help them to raise the technical level of their work and productivity of labour.

Scientists also help to raise the level of qualifications of engineers, technicians and bench workers, and encourage them to help in solving scientific problems.

Comrades, all these are fundamentally important new developments that are of immense significance both in speeding up our technical progress and in solving the social tasks of building communism.

Science should also serve more actively the development of the main productive force of society — the development of man himself, his capabilities and aptitudes, increasing man's usefulness to society. Scientists should give their active help in spreading a scientific philosophy among the broadest sections of the working people, in achieving the further progress of public education, of the physical, moral and aesthetic development of the population, in line with the lofty and noble norms of communism.

They must help the Party to find the best possible ways of resolving such historical tasks as progressive elimination of class distinctions and affirmation of complete social homogeneity in our society, further development of the Party's Leninist nationalities policy, and consolidating the unity of the Soviet people.

In a word, comrades, as you see, the Soviet scientist's responsibility to society has grown immeasurably in our time. As the development tasks we set ourselves grow in size and complexity, the role of the conscious element in society, the role of the Party, as the guiding force in communist construction, grows as well, as also does the role of science which must make a creative study of the problems that occupy the Party, the state and the people.

Today Soviet science enjoys great international prestige. The development of international scientific and technical relations is an inseparable part of the fight our Party and our state are waging for a lasting peace, for freedom and progress in the world. Here our cooperation with scientific organisations of the socialist community to implement long-term programmes on important issues related to the theory and practice of building developed socialism and communism deserves special mention.

Mutually advantageous scientific and technical relations with many countries that have a different social system are also successfully developing in the climate of international détente. This cooperation covers many fields: agriculture, transport, medicine, environmental protection, atomic energy, space research and many other branches.

From the bottom of my heart I wish our scientists and their foreign colleagues fresh success in all these endeavours that are of great importance to peoples.

Comrades, our country has now a powerful scientific potential. More than a million people work in various fields of science. This is a great force, and it is very important to use it properly.

Today when the part science plays has grown tremendously and when increasing funds are allocated for science, it is more important than ever to increase the effectiveness of the work done at scientific establishments and to eliminate the shortcomings.

There is no need to hide the fact that our scientists have not as yet attained the most advanced positions in every main area of research. Perhaps it is difficult to be first in everything at once. Yet this only increases the importance of having a really well elaborated research strategy, of concentrating our strength and resources in the decisive directions of research.

The number of research institutes and other scientific establishments in our country is constantly growing. This is, apparently, quite natural. But it is no secret that their social effect is far from equal in all fields. Alongside excellent research teams that our country is proud of, there are others that are simply marking time, devoting their attention to secondary matters and whose personnel are pretty weak.

Only the scientists themselves, and above all the Academy, with its rich experience, can decide the best and quickest ways of dealing with these shortcomings. Comrades, the Party calls on you to do this, the Party expects this of you.

There is no doubt that scientists and scientific organisations can and should, together with other links in our social organism, play a

very big part in such an important task as speeding up the application of scientific achievements in production.

Briefly, comrades, I would put it like this: the more the Party values our scientists' work and the part they play in building communism, the more it expects of them, the greater its demands on them. I do not think you will take offense at this. Because it only means that scientific knowledge, the intellectual potential of society is becoming an increasingly valuable social asset in our country.

Half a century ago, during the Civil War, in the grim period of general chaos and famine, Lenin said with firm conviction: "No forces of darkness can withstand an alliance of the scientists, the proletariat and the technologists." Today we can see how this great prophecy is coming true.

All the forces of darkness of our century are retreating in the face of the alliance of science and production, the unbreakable alliance of the working class, the collective-farm peasantry and the working intelligentsia. This is leading to the real triumph of human reason and the ideals of humanism.

May I express the confidence that the Academy of Sciences of the USSR, our research institutions and all Soviet scientists will continue to devote all their energies to the fight for the victory of the great cause of communism.

And now I have a pleasant mission: to present a well-earned award, the Order of Lenin, to the USSR Academy of Sciences.

(Comrade L. I. Brezhnev reads out the Ukaz of the Presidium of the Supreme Soviet of the USSR awarding the Order of Lenin to the USSR Academy of Sciences, attaches the Order of Lenin to the Banner of the Academy and, to the prolonged applause, hands over to the presidium of the meeting the text of the greatings of the CPSU Central Committee, the Presidium of the Supreme Soviet and the Council of Ministers to the Academy of Sciences, scientists and all workers of Soviet science.)

The Lofty Mission of the Science of Society

An article from *Kommunist*, No. 13, 1975, the series "Science and the Construction of a New Society" devoted to the 250th Anniversary of the Academy of Sciences of the USSR.

The social sciences have made an important contribution to the economy and culture of the USSR and to the development of the working people's Marxist-Leninist world outlook.

It is common knowledge that immediately following the establishment of Soviet power in the USSR great efforts were directed towards consolidation and development of the social sciences on the foundations and principles of Marxism-Leninism, and to inculcation of the materialist proletarian world outlook and the dialectical method of cognising social phenomena and refashioning social relations. On the organisational plane, those efforts found expression in the setting up, on June 25, 1918, the Socialist Academy (renamed the Communist Academy in 1924) with the aim of "studying and teaching both social knowledge from the viewpoint of scientific socialism and communism and the sciences contiguous to such knowledge".[1]

From the outset the Communist Academy (which became part of the USSR Academy of Sciences in 1936) was the country's leading centre for studying social processes from Marxist positions and training Marxist research personnel, who were urgently needed, and for propagating Marxist-Leninist theory. The organisation of studies in the humanities, this on a Marxist basis, was fostered by the establishment, in the 1920s, of the Marx-Engels Institute, the Red Professorate Institute, and the Lenin Institute.

Of particular importance to the development of the social sciences grounded in dialectical materialism was the fact that the process was given guidance by Lenin himself. His analysis of a wide range of theoretical and practical questions of the socialist reconstruction of society provided outstanding instances of the Marxist approach to the solution of problems in the social sciences. The methods used by

Lenin in his analysis of social processes in the emerging socialist society became an essential component of the social sciences, not only in content but form as well.

The formation of the social sciences in the Soviet land and their further development have been based on the creative and allround elaboration of the Marxist-Leninist teaching given in Party materials, in the decisions of congresses and conferences of the Communist Party, and in the writings of its leaders. The CPSU has made a major contribution to revealing the main problems in the world revolutionary movement and in the construction of socialism. Foremost among such problems are: the decisive significance of the proletarian dictatorship; the alliance between the working class and the working peasantry in the proletarian revolution and in socialist construction; the guiding role of the Party in accomplishing the tasks of socialist industrialisation, the development of cooperatives in the countryside, the cultural revolution, and the fundamental refashioning of society; the possibility of both peaceful and non-peaceful establishment of the dictatorship of the proletariat; the implementation of the principles of peaceful coexistence of states with differing social systems, and so on.

In dealing with questions raised by the practice of socialist transformations, the Communist Party has invariably employed a profound and allround theoretical analysis of social processes. In posing radically new problems or principles in its documents, the Party has always oriented the social sciences towards research in the most important fields, in keeping with the trends in social development. Already during the prewar five-year-plan periods, the development of these sciences was marked by major achievements and made a substantial contribution to the accomplishment of the tasks of the radical socio-economic and cultural reshaping of society.

The principles of the philosophy of dialectical materialism in their concrete application in the various sciences of society have provided a genuinely scientific foundation for a study of the complex processes of the gradual growth and strengthening of the elements of socialism, and provided a key to the discovery of the objective laws and trends in the historical, economic and cultural development of society in the direction of the full victory of socialism.

In research conducted by the *philosophers* of the USSR Academy of Sciences during the construction of socialism, special attention has been paid to problems of the study of the theoretical heritage of Karl Marx and Frederick Engels, the Leninist stage in the development of Marxist philosophy, and the links between the science of dialectics with the specialised disciplines in natural history and the social sciences. In the area of social development, Soviet philosophers have focused their attention on problems of the dialectics of the productive forces and production relations in the conditions of socialism, on the study of the regularities of the historical process, and on the elaboration of the theory of culture and the cultural revolution.

Many studies have dealt with problems of the unity of dialectical and historical materialism, and the significance of historical materialism for the cognition of the phenomena and processes of social life and the international revolutionary struggle. Considerable attention has been devoted to questions of scientific atheism and its links with Marxist-Leninist philosophy and progress in the natural and social sciences, with greater stress on the propaganda of atheism. An important part in evolving the Marxist-Leninist theory of scientific atheism and its propaganda was played by Academician E. Yaroslavsky.

Attempts to revise the principles of Marxist-Leninist philosophy and to distort them in a mechanistic and idealistic spirit were registered and subjected to criticism in the course of the discussion on the basic problems of world outlook, which was held in the second half of the 1920s and the early 1930s. Soviet philosophers gave decisive backing to the Party's general line and to the consistent implementation of the Party spirit in philosophy. The decision taken by the Central Committee of the All-Union Communist Party (Bolsheviks) in January 1931, regarding the results of the discussion, oriented Marxist philosophers towards the elaboration of problems of the Leninist stage of the development of dialectical and historical materialism and enjoined them to establish closer ties between the philosophical heritage and the practice of socialist construction and the international revolutionary movement. Their creative achievements and their contribution to socialist construction were based on the conversion of the social sciences into the science of society as based on Marxist-Leninist principles and methodology.

In the area of *economic science*, attention was focused on research into the peculiarities of industrialisation in the USSR and its radical distinction from industrialisation under capitalism, and the specific sources and methods of implementation of Soviet industrialisation in conditions of the capitalist encirclement and the economic blockade of the country. A tangible influence on the development of economic science was exerted by the broad discussions held in the late 1920s, during which Lenin's ideas on industrialisation and cooperation in agriculture were creatively developed.

In waging a struggle for the triumph of the Leninist programme of industrialisation and collectivisation and for the enhancement of a genuinely creative approach to complex economic phenomena, Soviet economists produced a number of major works on the political economy of capitalism and socialism, on problems of planning, commodity turnover, cost accounting, finances and price formation, statistics and demography, technical progress and the efficacy of capital investments, the competition between two world systems, as well as on the history of the national economy and economic thought. Already in those years, the first attempts were made to use mathematical methods in the economy. The development of Soviet economic science in those years was closely connected with the names of Academicians E. Varga, V. Nemchinov, S. Strumilin, and K. Ostrovityanov.

The development of economic science at the country's academic centres was directed on the whole towards ascertaining the objective

foundations and the content of the economic policy conducted by the Party and the Soviet state, a study of the objective laws that policy was based on, and towards finding ways to improve the planning mechanism in the economic activities of socialist society.

Socialist construction confronted *historical science* with major problems, in dealing with which it scored considerable success. In their writings, Soviet historians showed the masses as the main motive force in social progress.

From the very outset, many bourgeois historians did all they could, and still continue to do so, to present the Great October Socialist Revolution and the construction of socialism in the USSR as a kind of historical anomaly, or as a purely "Russian phenomenon". The aim of such falsifications of history is obvious: it is designed to sunder the integral world process of historical development, isolate the most progressive and revolutionary forces, and weaken the influence exerted on the course of world history by the successes of socialist construction in the USSR. Soviet historians have shown that the socialist revolution is not a fortuitous or limited process but a profoundly international phenomenon; it is the law-governed consequence of the maturing of contradictions engendered by the very system of capitalism, and a means of their resolution in the concrete historical conditions that have developed in the world at the beginning of the 20th century.

The history of the Bolshevik Party and of the Great October Socialist Revolution; the establishment of the Revolution's international character and significance; the historical process of the succession of socio-economic systems; the class struggle of the proletariat and the peasantry; the decisive role of the working masses at all stages of society's development, and the blending of the struggle for the proletarian revolution with that for the development and completion of profound democratic transformations — all these have been focal problems in Soviet historical science. Academicians M. Pokrovsky, B. Grekov, N. Lukin, E. Tarle, M. Tikhomirov, A. Pankratova, and V. Khvostov did much valuable work in the area of the history of the USSR and world history.

The awareness of the lines along which a new life was being built was bound up with the study of the processes of the development of the numerous peoples inhabiting the USSR, the blending of the national and international in the development of the Soviet peoples, the generalisation of the experience of socialist reconstruction in the developed and less developed areas of the country, and the stage-by-stage and consistent change in the socio-economic structure of the various republics and regions of the USSR.

The new social conditions opened up unprecedented opportunities and prospects for *oriental studies*, so traditional within the framework of the Academy of Sciences. The study of the East now proceeded with the declared aim of giving every possible assistance to the socialist reconstruction of Russia's Eastern areas, and to the revolutionary struggle for liberation conducted by the toiling masses in the eastern states abroad. As distinct from pre-revolutionary

oriental studies, Soviet scholars now focused their main attention on a study of the history and culture of the Eastern peoples both within the Soviet Union and beyond its borders, and on the conversion of their historical and cultural achievements into a powerful means of arousing their self-awareness and starting the construction of a new life and the movement for emancipation. A considerable contribution to Soviet oriental studies was made by Academicians I. Krachkovsky, V. Struve, I. Orbeli and N. Konrad.

The fundamental economic and social changes in the life of the peoples of the USSR have led to considerable advances in their language and cultural development and called for an extensive linguistic work. The creation of alphabets and systems of writing for over forty nationalities that were backward prior to the revolution, and the development of their languages have been a major contribution made by *linguistics* to the construction of socialism. The achievements of theoretical and practical linguistics in the 1930s and 1940s was closely linked with the work of Academicians I. Meshchaninov and V. Vinogradov.

By liberating the working people from all and any exploitation, socialism has given them equal rights, and shown them the way towards resolving the contradictions between the individual and society. The necessity arose of coping in a scientifically grounded way with the numerous problems in the construction of socialist statehood, genuinely popular democracy, and to inculcate a correct understanding of the freedom of the individual, socialist democracy and discipline, and the new attitude towards labour and socialist property. All these problems were elaborated and generalised by the Marxist-Leninist *science of law and the state.*

Of decisive importance for the development of the science of law were not only Lenin's writings but his practical activities in creating the Soviet state machinery and the new revolutionary law, and the experience gained by the Bolshevik Party in setting up governmental bodies. Lenin closely followed the development of Soviet legislation, drew up and edited drafts of the major decrees promulgated by the Soviets, and guided all legislative activities in the young socialist state. The Soviet science of law developed on the basis of the dialectic and materialist understanding of questions of law and the state.

The foundations of Soviet legislation in all areas of social life, a system built on new principles, were laid down and developed in the years of socialist construction on the basis of research conducted by jurists working in the Academy of Sciences of the USSR and with their active participation.

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Built up and consolidated in the course of socialist construction, the Marxist-Leninist social sciences have now entered a phase of development that is new in principle and linked with the peculiarities of the present stage of communist construction in the USSR, and the world revolutionary movement.

As is common knowledge, the construction of a new society in the USSR had ended by the early 1960s with socialism's complete and final victory. The radical changes in the country permitted the CPSU to make an important theoretical and political conclusion regarding the establishment of a developed socialist society in the country. Mature socialism is marked by a high level of the economy, socialist social relations, and the culture and consciousness of the masses. It possesses all the social, economic, cultural and spiritual preconditions for the successful creation of a communist society.

A mature socialist society reveals most fully those principles of socialism that express its nature. As shown in the Report of the CPSU's Central Committee to the 24th Congress of the Party, it is at this stage that the question is posed of creating "conditions favourable for the allround development of the abilities and creative activity of Soviet people, of all working people, that is, to develop the main productive force of society".[2] Mature socialism presupposes the accomplishment of a task of historic importance: the blending of the achievements of the scientific and technological revolution with the advantages of the socialist economic system. Set by the 24th CPSU Congress, this task has a direct bearing on the establishment of the material and technical basis of communism and on the entire range of problems of the construction of a communist society.

Soviet social scientists base their activities on the elaboration of the theoretical problems of present-day social development as provided in the materials of the CPSU and the Soviet Government. The Programme of the CPSU, the Party documents devoted to the 50th anniversary of the Great October Socialist Revolution, the centenary of the birth of V. I. Lenin and the 50th anniversary of the formation of the USSR; the decisions of the 23rd and the 24th Party congresses and the plenary meetings of the Central Committee that followed — all these give a comprehensive interpretation of the rich experience of struggle gained by the Party and the Soviet people for the achievement of communist ideals, and an analysis of the diverse practice of the world revolutionary process and the major specific features of the world's socio-political and economic development.

The attention of Soviet social thought is concentrated on the problems of principle brought forward by the practice of communist construction in the USSR, the socio-political and economic development of the world socialist system and the further advance of the world revolutionary movement.

The theory of *materialist dialectics* as an integral, profound and all-embracing theory of the development of natural and social phenomena, and their cognition by man is a highly important complex philosophical problem whose elaboration is called upon to provide an overall methodological foundation for the natural and social sciences. A collective monograph entitled *The History of Marxist Dialectics. The Lenin Stage* (1973) gives a detailed account of the allround development of materialist dialectics in the writings by Lenin and also in the works of Soviet philosophers since the 1920s. The erroneous and distorted treatment of materialist dialectics, contained in the writings

by bourgeois philosophers and revisionists, have come in for criticism. An important aspect of the theory of dialectics — Lenin's theory of reflection — was given further development in a collective work written by Soviet and Bulgarian philosophers and outstanding natural scientists entitled *Lenin's Theory of Reflection and Present-Day Science* (Sofia, 1973) and prepared for the 15th World Congress of Philosophers, this work sums up research carried out in the area of epistemology, creatively poses and deals with a number of new and pressing problems, and reveals the untenability of bourgeois and revisionist concepts directed against the theory of reflection as the cornerstone of materialist philosophy.

A number of problems bearing upon the Marxist understanding of social practice and the nature of cognition (the unity of the historico-materialist and epistemological aspects of practice; the relations between the principle of reflection and that of practice in Marxist-Leninist philosophy; the scientific and technological revolution as a specific form of the manifestation of the unity of practice and knowledge and the like) come in for consideration in a collective work *Practice and Cognition* (1973) which provides a blend of the theoretical elaboration of problems of world outlook and methodology, and a critique of bourgeois and revisionist concepts.

Questions of *historical materialism* as an overall sociological theory of social development, and of the methodology of concrete sciences of society were considered in detail in the following works: *The Principle of Historism in the Cognition of Social Phenomena,* and *Historical Materialism as a Theory of Social Cognition and Activity* (1972); *The Dialectics of Social Development, Lenin's Legacy and Present-day Philosophical Science,* and *Leninism and Theoretical Problems of Present-day Social Development* (1974). Soviet philosophers have prepared a number of writings dealing with the study and theoretical understanding of the practice of present-day communist construction, and the world revolutionary process. They include researches into the law-governed patterns in the new socio-economic system, the features of the establishment and functioning of a developed socialist society, the problems of the scientific governing of society, the blending of the achievements of the scientific and technological revolution with the advantages of the socialist system of the economy, and improvements of the Soviet way of life.

In the area of *scientific communism,* intensive research is being conducted on fundamental theoretical problems of mature socialism and the way in which it is developing into a communist society. Also under study are such important aspects of the theme as the change in the socio-class structure of Soviet society and control of social processes, the relation between objective conditions and the subjective factor in the construction of communism, the greater creativity of the masses and the further development of socialist democracy, advance in national relationships, the efflorescence and rapprochement of nations, the moulding of personality possessing allround development, the formation of communist morality, the increased

guiding role of the working class and the decisive significance of Party guidance in the establishment of a new society. The following writings deal with research into the various aspects of socio-political development in the USSR on the road of communist construction: *The Creative Activity of the Masses and the Development of Socialist Democracy* (1973); *Leninism and the National Question in the Conditions of Today* (1974); *Organisation and Management* (1972); *Leninism and the Control of Social Processes Under Socialism; The Scientific Guidance of Society (A Systems Analysis)* (both 1973); *Social Philosophy and the Guidance of Society* (1975); *The Party and Socialist Culture. The 24th Congress of the CPSU and Problems of the Spiritual Culture of Socialism; The Spiritual World of the Soviet Worker* (both 1972), *The Subject and System of Ethics* (1973); *Present-Day Progressive Aesthetic Thought; Problems of Aesthetics* (1974). Major works have been prepared by jurists on problems of the development of socialist democracy and the perfection of the administration of the state: *The Leninist Doctrine of Democracy and Legality and Its Significance for Our Times; The State and Democracy in the Period of the Construction of Developed Socialism* (both 1974); *Problems of Efficacy in the Work of Administrative Bodies; Legal Problems in the Guidance and Management of a Branch of Industry in the USSR* (both 1973) and *The Legal Status of Agro-Industrial Enterprises and Associations* (1974).

Together with positive research into problems of scientific communism, much has been done in the area of criticism of various forms of anti-communism, revisionism and reformism. A number of writings have been prepared which contain reasoned exposures of the fundamental philosophical and socio-political bourgeois concepts of the future of human society, the views of Right-wing revisionism, the sociological and historico-philosophical foundations of Maoism, and the political postulates of the latter. Subjected to special research and criticism are also present-day bourgeois concepts in questions of war and peace, neo-fascist "doctrines" and racialist and nationalist theories.

In their studies of the *economic aspects of current problems of communist construction,* our scientists have concentrated their efforts on an analysis of the specific features of the economy of a developed socialist society, of the system of economic laws and categories of socialism in their interaction, on the problems of perfecting the economic machinery, the interconnection between scientific and technological progress and the creation of the material and technical basis of communism, on the ways of enhancing the efficiency of social production. Works by Soviet economists are also giving further theoretical development to questions of improving production relations. The elaboration of a system of economic measures designed to raise the efficiency of material production is one of the main lines of fundamental research. In this connection, ways are being sought to raise the scientific level and extend the range of planning, improve the organisational structure of economic management, increase economic incentives to the development of

production, and the ever greater involvement of the working masses in running the economy.

A number of writings have appeared in recent years in the area of economic problems: *An Encyclopaedia of Economics. Political Economy,* in four volumes; *Problems of the Optimal Functioning of the Socialist Economy; Scientific and Technological Progress and the Efficiency of Social Production* (1972); *Automatised Systems of Management According to Branches of Industry; The Mechanisms of Economic Incentives Under Socialism* (1973); *Scientific and Technological Progress and the Economy of Developed Socialism. Essays on Political Economy; Scientific Foundations and Practice of Cost Accounting; Urgent Problems of Economic Theory; Socialist Accumulation. Questions of Theory and Planning; Economic Problems of the Optimisation of the Exploitation of Nature; Basic Features of the Economy of Developed Socialism; Prognostication of the Growth of the Socialist Economy* (1973); *Comprehensive Economic Planning (Posing of the Problem, and the Approach to Its Solution); Socio-Economic Problems of Labour in the Conditions of Developed Socialism; Economic Problems of Socialist Emulation; Foreign Economic Relations of the Socialist Countries* (1974).

Analysis of urgent problems of Marxist-Leninist economic theory and of the fundamental problems of the economy of developed socialism; the evolution of improved methods of management of that economy and the introduction therein of the achievements of the scientific and technological revolution—all these are conducted by the scientific personnel of the USSR Academy of Sciences in close contact with activities designed to expose bourgeois and revisionist economic theories. In this connection, mention might be made of the following works: *The Political Economy of Present-Day Monopoly Capitalism,* in two volumes (1971); *Present-Day Capitalism: New Phenomena and Contradictions; Against Bourgeois and Petty-Bourgeois Theories of Socialism* (1972); *State Property and the Anti-Monopoly Struggle in the Countries of Developed Capitalism* (1973); *Ideological and Political Trends of Imperialism* (1975).

Important work is being conducted by Soviet sociologists on *research into theoretical and practical problems in connection with the scientific and technological revolution.* Prominent among these is the book *Man—Science—Technology* (1973) compiled by a group of Soviet and Czechoslovak philosophers for the 15th World Congress on Philosophy (discussed at a special colloquium at the Congress) and given a positive reception; *The Scientific and Technological Revolution and Socialism* (1973); *Ideological Problems of the Scientific and Technological Revolution* (1974); *Questions of the Theory and Practice of Management and Organisation of Science* (1975). A wide range of research is contemplated for a series of monographs on the theme "Developed Socialism and the Scientific and Technological Revolution", such research being conducted by various institutions dealing with the social sciences in the USSR and other socialist countries. These publications will give a critique of bourgeois theories on the

basis of the Marxist-Leninist analysis of processes in the scientific and technological revolution.

In their examination of the scientific and technological revolution in the conditions of a communist society, Soviet social scientists show, on the one hand, how it is conditioned by the objective regularities of the development of mechanised and automated production, and, on the other hand, how that revolution is in keeping with public socialist ownership of the means of production. Because of the socio-industrial and political-economic determination of processes that go to make up the scientific and technological revolution, it is the latter that operates as the mainspring in the creation of the material and technical basis of communism.

Recent years have witnessed comprehensive studies on a number of important problems in the area of *history*, this with a perceptibly higher ideological and theoretical level of such studies, enhanced links between works on history and the practice of communist construction, the tasks of the current ideological struggle, and questions of the moulding of the new man. There have been advances in the comprehensive nature of work on major problems, with creative contacts becoming stronger, not only among scholars working at the Academy's institutes in the area of history but also between them and representatives of other fields of the social sciences: economists, philosophers, sociologists and philologists.

Historical science has made considerable strides in the study of the experience of the Great October Revolution. Researches already completed have revealed a complex picture of the struggle waged by the Bolshevik Party for the successful preparation for the socialist revolution and its consummation in the USSR. Under study have been various aspects in the activities of the working class, and the significance of the struggle waged by the peasant masses during the February and the October revolutions and in the process of the socialist transformations effected after the establishment of Soviet power. The role of the army has also been analysed and studies have been made of the national movements during the October Revolution.

Another indubitable achievement has been the preparation of the following fundamental and comprehensive works: *A History of the USSR from Ancient Times to Our Days; The History of the Second World War (1939-1945)* in the 12 volumes (Chairman of the Chief Editorial Commission A. Grechko). A two-volume *History of the Foreign Policy of the USSR* has been published, under the editorship of B. Ponomaryov, A. Gromyko and V. Khvostov. Work is in progress on the final stages of the publication of a multivolume *History of the Communist Party of the Soviet Union;* preparation has begun of supplementary volumes of *World History* (Chairman of the Chief Editorial Commission Academician E. Zhukov); a multivolume *The World Working-Class Movement. Questions of Theory and History* (Chief Editor Academician B. Ponomaryov). All these generalising works take account of recent monographs and are based on vast documentary material.

It was with enthusiasm that Soviet historians worked on preparations for jubilee editions for the centenary of the birth of V. I. Lenin. Historical literature on Lenin was enriched with major research which, on the basis of the rich theoretical legacy of the leader of the working people, showed his role in the establishment of the Communist Party, the victory of history's first socialist revolution, the construction of a new society in the USSR, and the development of the world revolutionary and national liberation movements. The immense significance of the ideas and the organisational leadership given by V. I. Lenin for the victorious proletarian revolution in Russia is shown in group writings on the establishment of Soviet rule in the Ukraine, Byelorussia, Central Asia and Kazakhstan, in Transcaucasia and the Baltic Republics. Also dealing with the same subjects is a three-volume monograph by Academician I. Mints, *The History of the Great October* (awarded a Lenin Prize for 1974) and other writings. Considerable successes have also been achieved in the study of the history of antiquity (works by Academicians B. Rybakov, A. Okladnikov and B. Piotrovsky).

Also published have been a number of generalised studies on literature. Here are some of the major studies in this field: *A History of Soviet Multinational Literature* (7 books); *Lenin's Heritage and Present-Day Literature; Problems of Artistic Form in Socialist Realism* (2 volumes). Work has been completed on a collective publication, *Socialist Realism at the Present Stage of Its Development.* Work is under way on such an important range of problems as the interaction between the literatures of the peoples of the Soviet Union, and the formation of the artistic culture of developed socialism. Academician M. Khrapchenko's *The Writer's Creative Individuality and the Development of Literature* was awarded a Lenin Prize for 1974.

The results of research conducted in recent years in various branches of the science of society have provided excellent material for the writing of a number of new textbooks and manuals that meet the heightened demands presented by the inculcation in the working people of a communist world outlook based on a firm foundation of scientific theory, and by the education of the masses in the ideas of Marxism-Leninism. Soviet higher schools and other links in the system of education of the working people have now been provided with textbooks on all the branches of Marxist-Leninist theory. Among such publications are: *The Fundamentals of Marxism-Leninism* (by a group of authors led by Academician O. Kuusinen); *Fundamentals of Marxist-Leninist Philosophy* (by a group of authors under Academician F. Konstantinov) and *Scientific Communism* (Chief of authors' collective Academician P. Fedoseyev); *Political Economy. The Capitalist Mode of Production* and *Political Economy. Socialism: The First Phase of the Communist Mode of Production* (edited by Academician A. Rumyantsev). New textbooks and special courses have also been brought out for other departments of the science of society, with due account of present-day advances in the practice of communist construction and scientific thought.

The development of studies in the humanities within the system of the USSR Academy of Sciences is now proceeding in close contact with scholars working in the same fields in the fraternal socialist countries. Extensive joint work is proceeding on the elaboration of urgent socio-economic, political and ideological problems of the world socialist system. Particular attention is being given to multilateral cooperation between the academies of sciences in the socialist countries, in the area of the natural and social sciences, with the programme of academic research on a multilateral foundation being constantly expanded. At present, that programme includes 16 complex scientific problems, among which, in the field of the social sciences, we shall mention the following: researches into present-day capitalism; the ideological struggle in the conditions of the coexistence of two world systems; improved planning and management of the economies of the CMEA member states; the evolution of the social structure of socialist society; the economies and policies of the independent countries of Africa; the history of the Great October Socialist Revolution.

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The Decision issued by the Central Committee of the CPSU on August 10, 1967 "On Measures for the Further Development of the Social Sciences and the Enhancement of Their Role in Communist Construction" was a landmark in the expansion and strengthening of the front of research in the humanities. Eight years have elapsed since this important Party document was adopted, a period marked by historic events in the life of the Soviet state and of all progressive mankind: in 1967, the country celebrated the 50th anniversary of the Great October Revolution; 1970 was the centenary of the birth of Lenin; 1971 saw the 24th Congress of the CPSU; 1972 marked 50 years of the foundation of the USSR, while 1973 was the 70th anniversary of the Second Congress of the RSDLP. As is common knowledge, all these events exerted a tremendous influence on the creative activities of the research centres engaged in the humanities at the USSR Academy of Sciences, as well as of all scholars engaged in the Soviet social sciences.

The tasks the Soviet people are engaged in coping with, in the process of construction of communism in the complex conditions of the present-day world development, call for ever deeper and more active elaboration of the scientific problems of the revolutionary refashioning of society. A scientific understanding and generalising of practical experience, and a detailed analysis of objective contradictions and trends in social progress enable the CPSU to foresee the course of social processes both within and outside the country, evolve a correct political strategy and concrete methods for solving highly complex social problems, and map out a programme of the social and economic transformation of society in keeping with the actual achievements of the Soviet people, with due account of the

interests of the development of the entire world socialist system, and on the basis of the objective regularities of the natural historical process. That is why the CPSU attaches prime importance to questions of the perfecting, consolidation and concretisation of Marxist-Leninist theory and the further advance of studies in the humanities at institutions under the USSR Academy of Sciences. L. I. Brezhnev, General Secretary of the CPSU Central Committee, said in his report on the 50th Anniversary of the USSR: "As in industry and agriculture not a single advance can now be made without the aid of the latest achievements of science, so in the life of our society the development of science is the indispensable basis for the adoption of decisions and for day-to-day practice. The Party continues, as it has always done, to support the innovative, Leninist approach to the study of complex social phenomena and the efforts of our theorists to develop social theory and creatively analyse reality."[3]

The Party, which is confirming and developing Marxism-Leninism as the theoretical foundation of its revolutionary and transforming activities, provides models, in its documents, of how, on the basis of Lenin's ideas and the Leninist methods, urgent problems of communist construction should be creatively posed and dealt with.

NOTES

[1] *Decrees of the Soviet Government*, Moscow, 1959, Vol. II, p.468 (in Russian).
[2] *24th Congress of the CPSU. 1971*, Moscow, 1971, p. 51.
[3] L. I. Brezhnev, *The Fiftieth Anniversary of the Union of Soviet Socialist Republics*, Moscow, 1972, p. 82.

Socialist Democracy and Production

FELIX RUDICH

The problem of improving the country's economic management has always been within the field of vision of the Communist Party of the Soviet Union. Its urgency is due to the tasks of further developing Soviet society and to the objective necessity to combine the achievements of the scientific and technological revolution with the advantages of the socialist system of economy, with the enhancement of the economic and social efficiency of production.[1]

Among the problems pertaining to the improvement of the economic mechanism, the one that concerns the growing role of the working people in the management of socialist production presents considerable interest. As pointed out at the 24th Congress of the CPSU, "*a further development of socialist democracy,* broader participation of working people in running production, is an important condition for raising the effectiveness of the organisation and management of the economy".[2]

The present development of socialist production in the USSR is being effected on the basis of the policy drawn up by the March and September (1965) Plenary Meetings of the CPSU Central Committee, endorsed and further elaborated by the 23rd and 24th Congresses of the Party. "Enhancing the quality of our work," General Secretary of the CPSU Central Committee L. I. Brezhnev has said, "has become a key problem for the development of our national economy. This concerns the quality of our plans, that is, how well substantiated and balanced they are. This concerns the quality of managerial activity—from the primary links of the production administration to central economic agencies."[3] So it is an important and urgent task to work out and implement new managerial principles which are based on the creative development of the Party theory, and which ensure

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a high efficiency of production and presupposes broad participation of working people in resolving the key problems of management.

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The process of perfecting the mechanism of economic management in the USSR is proceeding on the basis of the Leninist principle of democratic centralism, which has been and remains the organisational foundation in all spheres of activity of the Communist Party and the Soviet State. Lenin emphasised in every possible way the significance of this principle for the rational organisation of economic and managerial activity. He pointed out that "large-scale machine industry—which is precisely the material source, the productive source, the foundation of socialism—calls for absolute and strict *unity of will,* which directs the joint labours of hundreds, thousands and tens of thousands of people. The technical, economic and historical necessity of this is obvious, and all those who have thought about socialism have always regarded it as one of the conditions of socialism".[4]

At the same time, Lenin firmly denounced any metaphysical opposition of centralism to democracy, of centralised leadership to the independent initiative of the masses. "Centralism, understood in a truly democratic sense, presupposes the possibility... of a full and unhampered development not only of specific local features, but also of local inventiveness, local initiative, of diverse ways, methods and means of progress to the common goal."[5] The combination of elements of centralism and democracy in economic management was regarded by Lenin as one of the prerequisites for the successful solution of the tasks of socialist and communist construction.

The main guideline for deepening the democratic principles in production under mature socialism consists primarily in the qualitative improvement of the activity of the already existing and established forms of working people's participation in management. This, of course, does not rule out the emergence of new democratic institutions of administration.

While defining the ways and means of developing the democratic principles in production, we must not race ahead and artificially push forward the social processes; or should we exaggerate the role of the agencies of public self-administration and oppose them to the state bodies, whose activity is determinative at the present stage. On the other hand, it would be wrong to restrict the development of the working people's creative initiative, awakened in the context of the construction and functioning of developed socialism.

The CPSU abides firmly by the policy of correctly combining the directive assignments of the central agencies with the initiative of enterprises, with the broadening of their rights and powers. That is why in the development of the system of economic management in the USSR two dialectically connected tendencies may be distinguished:

the tendency towards enhancement of the principles of centralisation in management, towards the development and improvement of the system of economic guidance and the tendency towards a broadening of the democratic principles of management, towards development of the initiative and independent activity of the local economic mechanisms, towards extensive involvement of working people in the management of production.

Moreover, in dealing with this problem we must not think that the involvement of working people in the management of production is possible on the level of enterprises only. "The people's participation in economic management is not confined to resolving economic tasks in individual production collectives," the 24th Congress of the CPSU emphasised. "A broader approach has to be adopted to this, in view of the role which our Party and the Soviet state play in economic management."[6] The leading role of the Communist Party and the administrative-organising function of the state in the life of Soviet society are dictated by the fact that they express and represent the basic interests of the working class and all working people.

Under socialism, the representative bodies of the Party as well as those of the state express the interests of the working people. This circumstance permitted Lenin to define Soviet power as *democracy for the working people*[7]—democracy in the sense that for the first time the representative political and state organs began to express the interests and hopes of the working people at large. Ever since the first years of Soviet power, the Communist Party and the socialist state have been doing their utmost to make every politically conscious working man feel "that he is not only the master in his own factory but that he is also a representative of the country."[8]

Under socialism, especially when socialist society has reached the stage of maturity, the principle of representation continues to operate in all spheres of management, including economic management. It requires the function of managing social production to be exercised by professionally competent and politically educated persons. The employment of highly skilled specialists in the management of production does not at all mean creating in socialist society a special, privileged social group or section. The class and social function of the machinery of economic management cannot accrue directly from the social status of the managers.

The political meaning of socialist economic management lies in the fact that it embodies the policy of the Communist Party. And any production or organisational, any social or managerial function is of political import, since the development of socialist society towards communism always proceeds as a *politically* organised process, and it is only at the highest stage of the communist social formation that organisational and managerial actions "will lose their political character and be transformed into the simple administrative functions of watching over the true interests of society"[9]—the functions of communist self-administration.

We should always perceive in the activity of the agencies of economic management the realisation of the policy outlined by the

Communist Party—the political vanguard of the working class, which expresses its class interests and the interests of all working people who are making joint efforts with the working class to perform its great historical mission, namely, the building of a communist society. The Party determines the whole course of society's advancement, formulates the tasks of social, political, economic and cultural development, and defines the ways and means of fulfilling them. In the final analysis, all this clearly manifests the leading role of the working class in building communism.

With the growth of socialist production, its success depends on personnel to a decisive degree. The new tasks of economic and social development require an ever higher level of professional training for the managers of enterprises and production associations, and of the agencies administering production. "We greatly need professional people of our own socialist formation," L. I. Brezhnev has said, "people who could combine competence and initiative with the Party spirit, with concern for the interests of all people. The contemporary economic executive must understand well the essence of the Party's economic policy and be broad-minded like a statesman, and he must make full use of the reserves of production.... While improving the work with personnel, the Party sees not only the tasks that face our country today, but also those which will confront it tomorrow."[10]

The task of training and retraining managerial personnel becomes even more urgent because in our time specialised technical knowledge has to be enriched every seven-ten years, and the need to retrain managerial staff arises every five years. It is for this purpose that the USSR has set a system of retraining top-level personnel (the Institute of Economic Management attached to the State Committee of the USSR Council of Ministers for Science and Technology), medium-level and local supervisors (at present the country has 50 advanced professional training institutes, 93 departments at higher educational establishments and 600 refresher courses sponsored by enterprises[11]). This system enables supervisors of production promptly to refresh their knowledge and learn new methods and forms of management (the organisation of the processing of information, and of managerial work, the scientific organisation of labour, engineering psychology, the application of electronic computing machines in management, production management with the use of automatic control systems, etc.).

Practice has advanced the basic requirements which the supervisor of socialist production who exercises undivided authority must be up to. He must be politically mature, purposeful and devoted to the common cause. Apart from these qualities, he must have a talent for organisation, adequate professional and technical training, a knowledge of the science of organisation and management, high competence, considerable culture and general erudition. Finally, he must enjoy prestige and wield influence in the work collective under his supervision, and he "must possess a high degree of personal appeal",[12] and the skill to create the moral and psychological climate needed for creative work.

The retraining of economic executives also raises their level as political leaders of production collectives. "We approach the problems of economic leadership and its improvement not from narrowly economic positions," L. I. Brezhnev emphasised in his report to the December 1973 Plenary Meeting of the CPSU Central Committee, "for us this is a Party matter whose success depends largely on the political atmosphere in all sections of our society."[13] The Party has always proceeded from the fact that in the development of production it is important to secure optimal combination of economic and political approaches, of economic and political factors, and to take decisions on the basis of not only purely economic criteria, but also of a wide range of political aspects of economic development.

One of the important and urgent problems whose solution requires the economic as well as the political approaches is, today, the problem of supervising new forms of organisation of enterprises and production associations. A production association sets a number of new organisational-managerial tasks, requires the concentration of highly skilled specialists in management who are competent in diverse fields of activity, and raises the question of the most efficient combination of one-man and collective management, of the elaboration of new forms of working people's participation in socialist management.

The practice has given rise to a number of democratic institutions at the level of production associations — Councils of Directors in the USSR and Hungary, Economic Councils in Bulgaria, Public Councils of the Associations of People's Enterprises in the German Democratic Republic, Collegiums in Poland, Management Committees in Rumania.

In the USSR and other socialist countries, the collective management bodies are vested with considerable rights and powers, and they actively promote the implementation of new principles of management, the prevention of voluntarist decisions and errors, and higher efficiency in managing social production. Experience has shown that their work is more successful when the board of a production association promotes objective and prompt adoption of individual decisions and their fulfilment, efficient functioning of the economic mechanism in all sections of production, and greater responsibility for the state of affairs. Its success also depends on the level of discipline in production and technology.

The collegiums, as a rule, widely represent workers of the enterprises of the given association, of research institutes and higher educational institutions which investigate subjects relating to economic contracts, specialists in other branches, and leaders of Party and public organisations. Attention is concentrated on the elaboration of long-term plans and on the improvement of the methods of production management. In view of this recommendations are periodically submitted to the General Director of the association, who then informs the collegium of their execution. This procedure broadens the powers and authority of the democratic institutions and

enables them to wield active influence on the work of the management. But at the same time the collegium in all cases acts as a consultative body which has no right to rescind the decisions adopted on issues within the competence of the General Director. Thus, the supervision of a production association is based on the principle formulated by Lenin: "There must be individual responsibility — this and individual management are as necessary as collectivism is essential in discussing basic questions if there is to be no red tape and no opportunity to evade responsibility."[14] The validity of decisions is thereby raised, for the decisions adopted individually are based not only on the experience of the manager, but on the experience of the whole production collective, which makes it possible vigorously to develop socialist democracy, improve the managerial machinery and resolutely eradicate elements of bureaucracy. Practice has confirmed that in the conditions of today, even if the professional level of the production board is sufficiently high, the successful fulfilment of organisational-managerial tasks at the level of associations is no longer possible without increasing the number of participants in collective decision-making, without recruiting representatives of the related fields of material and cultural production and representatives of the working people.

But even more conspicuous is the process of democratisation of the managerial system at the level of local economic bodies — a process effected within the framework of their rights and powers, which have been considerably broadened as a result of economic reforms. The mass of the working people in the socialist countries participate in the management of production through the medium of representative bodies as well as *directly,* through various kinds of democratic institutions which draw the working people into the management of enterprises.

Returning to Lenin's proposition that every politically conscious worker must feel that he is a representative of the country, we must emphasise that in the period of perfection of mature socialist society and of the creation of the material and technical basis of communism, it is no less important for the conscientious working man to feel that he is the master in his factory. Not only must he feel so, but he must act energetically as an experienced master who strives with maximum efficiency to utilise for the good of the whole society the share of social wealth entrusted to him in the process of production.

It is the development of the feeling of being a master that forms the basic content of the education of the working people as they participate in the management of socialist production. Through the representative bodies of the socialist state, the working people participate in the administration of the national property, of the whole national economy. They also have the opportunity to participate personally in supervising a certain part of the public wealth. In a socialist society, the industrial and office workers, the engineers and technicians are the real masters of their labour, since socialism grants every member of society the opportunity "to participate not only in

production but also in the distribution and administration of social wealth."[15]

The cultivation of a socialist attitude towards public property means primarily cultivating in the working people an intellectual interest in the most effective organisation of production in their enterprises — an interest which by no means denies the importance of materal incentives but which in a sense is more prospective, for it is the precursor of the communist attitude towards labour. "The communist organisation of social labour, the first step towards which is socialism, rests, and will do so more and more as time goes on, on the free and conscious discipline of the working people themselves,"[16] Lenin wrote. Today the prerequisites for the communist attitude towards labour are taking shape.

The direct participation of working people in administering the production process has a number of characteristics that differentiate it from the activity of the representative bodies. We have already dealt with direct participation in management (through participation in democratic institutions of management) and with the combination of the functions of the organiser and the working man. A no less important characteristic of this activity is that political, production-organisational and social-managerial tasks are resolved on the basis of equally *direct unification* of industrial and office workers and the engineering-technical intelligentsia in the process of work of the democratic institutions. In such institutions of administration the leading role of the working class is manifested primarily in the fact that it increasingly improves material production and augments its direct contribution to the creation of the aggregate social product. At the same time, the process of working people participating in the management of production begins to manifest concrete forms of advancement towards social homogeneity of socialist society.

The working people's participation in the management of production enables us to raise in a new way the question relating to the social development of production collectives. The process of this development proceeds in three basic spheres — economic, socio-political, and spiritual.

In the economic field, the democratic institutions of management work for allround improvement of socialist production with a view to raising its efficiency and bringing out inner potentialities and reserves. The problem of heightening the qualitative aspect, of utilising the reserves of production, is being raised today to a basically new level in the USSR, since extensive methods of development as regards many indicators (the possibilities of drawing new labour resources into production, the rates of growth of capital investments, etc.) have in the main been exhausted; and so the task is to intensify production.

"We must rely mainly on enhancing the effectiveness of production," the Report of the CPSU Central Committee to the 24th Party Congress emphasised. "The crux of the problem is to achieve a substantial increase of output and of the national income per unit of labour and material and financial inputs."[17] In tackling this responsible

task, socialist emulation is called upon to play an important role. Lenin made a profound theoretical analysis of socialist emulation and defined its basic social content. "And it is precisely the Soviet form of organisation," he pointed out, "by ensuring transition from the formal democracy of the bourgeois republic to real participation of the mass of working people in *administration,* that for the first time puts competition on a broad basis."[18]

The practice of socialist emulation in the USSR has been helping to secure the highest productivity of labour. Today the movement for a communist attitude towards labour and the adoption of counter-plans proposed by the workers themselves have become a key form of mobilising the internal resources of production. That is why the CPSU Central Committee has emphasised that the further development of socialist emulation and the improvement of its organisation are an indispensable requisite for the successful implementation of the programme for the country's economic, social and political development.[19] The importance of the tasks resolved in the course of socialist emulation has made for its exceptionally wide scope: during the last year of the Ninth Five-Year Plan period more than 83 million people took part in it.[20]

Socialist emulation promotes the growth of the creative activeness of the masses and the development of relations of cooperation and mutual assistance, and gives rise to numerous public bodies where the working people acquire skills in the management of production.

As is known, in the USSR and other fraternal socialist countries there is a constantly improving and widely ramified network of public associations which involve the working people in management. The experience of the currently operating forms of developing the creative activeness of employees of socialist enterprises is being generalised, and a search for new forms is under way.

At present, commissions for exercising control over economic activity, trade-union conferences and workers' meetings are important forms of working people's participation in the management of production in the USSR. The country's enterprises and organisations have 160,000 Standing Production Conferences, to which 6 million people have been elected, 64 per cent of them being workers[21]; they also have 1,226,000 People's Control groups and offices uniting over 9 million people.[22]

Other fraternal socialist countries have set up similar forms of democratic institutions. In Bulgaria, Foremen's Councils and Economic Committees are the new forms of participation of workers and the engineering and technical personnel in the management of the socialist economy. More than half of the members of these Committees take a direct part in the production process. In Hungary, the trade unions sponsor Workers' Meetings, Production Conferences, Technical Conferences and Rallies of Socialist Labour Teams. In the German Democratic Republic, the legalised forms of working people's participation in management are Commissions of Factory Party Organisations for Control over the Activity of the Management, Conflict Commissions, Production Committees, and Worker-Peasant

Inspection. In Poland, Conferences for Workers' Self-Administration are in operation. In Rumania, the public institutions which involve the working people in the solution of the key economic problems are the Working People's Councils, Committees and General Meetings at different levels. In Czechoslovakia, trade-union meetings, Technico-Economic Councils and Conferences, and Production Conferences are important forms of the working people's participation in management. The activity of the institutions of socialist democracy in production, the improvement of socialist emulation in particular, is being constantly studied by Party organisations, and the generalisations of advanced know-how are being utilised for further raising the efficiency of social production.

The improvement of the technical equipment of production and the speediest and fullest utilisation of the latest scientific and technological achievements is an equally important form of raising the efficiency of production (a form that is closely connected with modernising its organisation). The basic forms of combining science with production are scientific-production associations and economic contractual works executed by research collectives by order of enterprises. But in this sphere, too, the independent initiative of the people plays a definite role in raising the efficiency of production.

Another form of mass participation of the working people in the management of production is the movement of rationalisers and inventors united in scientific-technical societies. In the Ukrainian SSR, these societies have a membership of more than 1.5 million. The participation of the working people in resolving the tasks of modernising the technical equipment of production is also maintained through design and technology offices operating on a voluntary basis, through creative groups for the development of rationalisation proposals and inventions, conferences for the exchange of experience, technical information bureaus, etc. These democratic institutions play an auxiliary but very significant role in combining the achievements of the scientific and technological revolution with the advantages of the socialist system of economy.

The social significance of these forms of working people's participation in the development of labour collectives engaged in the economic field is due to the fact that the fulfilment of economic tasks in this context is intertwined with the fulfilment of the tasks of the social and political development of the collectives — with the work for improving relations inside the collectives and with the development of tendencies towards the social homogeneity of production collectives. What gives rise to these tendencies is the close cooperation between representatives of the working class and those of the engineering and technical intelligentsia in the process of modernising the techno-economic aspects of production. The essence of the relationships between the working class and the intelligentsia, in our view, has been profoundly analysed by Academician P. Fedoseyev, who stresses that "the dialectics of underlying the formation of social homogeneity is such that it is neither the intelligentsia that is integrated with the working class, nor the working class that is integrated with the

intelligentsia, but that the social distinctions between them are increasingly obliterated, as mental and manual labour are organically combined in men's productive activity."[23] While certain distinctions between the working class and the intelligentsia are preserved under socialism, their interaction enriches both sides: the working class acquires the theoretical knowledge and the qualification of the intelligentsia, and the intelligentsia acquires the practical knowledge and the traits of discipline and high level of organisation of the working class.

Finally, the spiritual development of production collectives presupposes ideological staunchness and conscientiousness, the formation of communist relations between members of the collective and their education in the spirit of proletarian internationalism and Soviet patriotism, and the raising of their general educational, theoretical and cultural levels. To further improve the activity of the democratic institutions of socialist production, it is important to raise the general educational level and the scientific-technical training of the working people, above all the working class, since participation in the management of production requires a combination of general and specialised knowledge. In 1939, for instance, 8.4 per cent of the workers in the USSR had a complete or incomplete secondary education, as against 64 per cent in 1972. We are witnessing an active social process involving the development of the worker who has nothing but skilful hands into a worker who can understand blueprints and technical books. The volume of labour connected with the servicing of machinery is increasing; the monitoring functions are expanding.

The economic education of the working people is an important factor in inducing them to participate in the management of production. The Resolution of the CPSU Central Committee "On Improving the Economic Education of the Working People" (1971) emphasised that without acquiring the fundamentals of economic knowledge and understanding the mechanisms of the economic system, the mass of the working people would not be able to participate effectively in the management of socialist production. Today broad sections of industrial and office workers, and the engineering-technical personnel are given an economic education. In the Ukrainian SSR alone, 7,700,000 people received an economic education in the Ninth Five-Year Plan period.

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It is a general law governing the development of mature socialist society that the working people should play a growing role in the management of production, as the experience of the Soviet Union and other socialist countries has shown. Observance of this law leads to the rise, in the practice of socialist management, of new democratic institutions, on entering which the working people participate in the management of production.

NOTES

1 For more details see the special collection of articles entitled "The Scientific and Technological Revolution and Management of Socialist Economy", *Social Sciences*, No. 1, 1973.

2 *24th Congress of the CPSU, 1971*, Moscow, 1971, p. 188. The enlistment of the cooperation of the working people at large in running the socialist economy is one of the major laws of socialism observed in the practice of most socialist countries. It is specified in the policy documents of the parties of these countries. "The economic system of socialism becomes more efficient as it promotes the development of the creative initiative and the conscientious actions of the working people," says the Resolution of the Eighth Congress of the Socialist Unity Party of Germany [see *The Eighth Congress of the Socialist Unity Party of Germany*, Moscow, 1972, p. 210 (in Russian)]. At the Sixth Congress of the Polish United Workers' Party it was stated: "What is needed in this sphere is to heighten the role of workers' self-government and that of the main trade-union sections, which make the work collectives aware of the direct dependence of living standards on the country's economic potential" (see *Tribuna Ludu*, December 7, 1971). The 11th Congress of the Hungarian Socialist Workers' Party emphasised: "The foremost task is to develop intra-plant democracy, democracy in the place of employment of everyone" (*Pravda*, March 18, 1975). This idea is also expressed in the policy documents of other parties.

3 "For the Sake of Peace and Happiness of the Soviet People", Speech by Comrade L. I. Brezhnev, *Moscow News*, No. 25, 1975, p. 4.

4 V. I. Lenin, *Collected Works*, Moscow, Vol. 27, pp. 268-269.

5 Ibid., p. 208.

6 *24th Congress of the CPSU, 1971*, Moscow, 1971, p. 85.

7 See V. I. Lenin, *Collected Works*, Vol. 28, p. 277.

8 Ibid., Vol. 27, p. 403.

9 K. Marx and F. Engels, *Selected Works*, Moscow, 1969, Vol. 2, p. 378.

10 The collection *Towards New Victories in Serried Ranks*, Kiev, 1973, p. 32 (in Russian).

11 See *Foreign Centres for Managerial Training*, Moscow, 1975, pp. 5-6 (in Russian). Most of the European socialist countries likewise have instructional centres for the retraining of managerial personnel. In Bulgaria, this work is done by the Centre for the Professional Qualification Improvement of Managerial Personnel, attached to the Academy of Social Sciences and Social Administration; in Hungary—by the All-Hungarian Centre for the Training of Executives; in the German Democratic Republic—by the Central Institute of Socialist Management; in Poland—by the Chief Centre for the Qualification Improvement of Managerial Personnel; in Rumania—by the Republican Instructional Centre; in Czechoslovakia—by the Administration Institute.

12 V. I. Lenin, *Collected Works*, Vol. 36, p. 600.

13 *Pravda*, May 24, 1974. Quoted from the editorial.

14 V. I. Lenin, *Collected Works*, Vol. 30, p. 245.

15 K. Marx and F. Engels, *Selected Works*, Moscow, 1970, Vol. 3, p. 86.

16 V. I. Lenin, *Collected Works*, Vol. 29, p. 420.

17 *24th Congress of the CPSU, 1971*, Moscow, 1971, p. 67.

18 V. I. Lenin, *Collected Works*, Vol. 27, p. 259.

19 See *Problems of the CPSU's Ideological Work. A Collection of Documents, 1965-1973*, Moscow, 1973, p. 301 (in Russian).

20 See *Pravda*, August 28, 1975.

21 See *Ekonomicheskaya gazeta*, 1972, No. 27, p. 13.

22 See *Izvestia*, December 27, 1974.

23 See P. Fedoseyev, "The Main Lines of Research in the Social Sciences", *Social Sciences*, No. 3(9), 1972, p. 98.

Regional Aspects of the Transformation of the Environment in the USSR

INNOKENTI GERASIMOV,
ALEXEI MINTS

One of Soviet society's priority social aims is to create the best possible conditions for the life and health of the entire population in all parts of the country, despite substantial natural and economic contrasts. The basic technical and economic programmes for utilising natural resources and protecting and improving the environment are among the means that must help to achieve this aim.

In drawing up and giving effect to these programmes it is of the utmost importance to adopt a geographical approach, that takes into account the essential natural distinctions between individual parts of the Soviet Union's vast territory, the historical distinctions in the level of economic development and the distinctions in the territorial structure of the economy of different regions. This approach ensures the necessary regional differentiation in all-Union programmes, in the technical means and forms of utilising natural resources, the measure of which is linked with a cumulative account of three different but

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inter-related systems and must be based on three groups of conditions:

natural, consisting of considerable differences in the structure of the natural-resource potential, natural conditions of production and the life of the population in various regions of the country;

socio-economic, characterised by historically-shaped differences in the level of economic and demographic development of the territory, labour productivity and efficiency of social production; the special factor here is the national-state system of the USSR, which requires the attainment of relative equality in the living standard and quality of life of the population in all regions;

technical, linked with the expediency of using various technical means (specialised implements of labour, technologies and so forth) under different natural and economic conditions.

The composite geographical approach is similarly important in problems related to the utilisation of natural resources on account of the inter-relation of individual components of the natural environment (relief, climate, water, soil, etc.). These inter-relations manifest themselves in the existence of natural spatial complexes — landscapes, geocomplexes, ecosystems.

From the aforesaid it follows that it is necessary to bring to light, analyse and resolve a special class of problems: geographical or regional-complex problems of the environment, the use, remoulding and protection of the environment.

This approach takes into account the reality of two processes: territorial differentiation in the development of natural resources and the influences exercised on the natural environment; regional integration of techno-economic and socio-economic factors in given territories, as a result of which territorial-production and other social complexes of a regional type take shape.

The composite approach, employed in the USSR on the basis of public ownership of the means of production and central economic planning, makes it possible to resolve problems of environmental protection in a most comprehensive manner. This approach gives scope to solutions based on the use of instruments of regional planning. Besides, it is possible, in particular, to choose between two strategies:

a) correcting the use, in the most densely populated areas, large urban agglomerations and so on, of an assortment of the most efficient technical means of combating pollution and reproducing renewable natural resources;

b) planned reorganisation of the existing spatial economic structure with account of regional programmes for the utilisation of natural resources and the protection of the environment; in this case it is possible either to deconcentrate the productive forces with their relatively even distribution in developed and reserve territory, or radically move industries that are most "aggressive" towards the environment to areas situated far from places with optimal environmental conditions (the latter are reserved for settlement and recreation), or effectively combine these two approaches.

The totality of knowledge about the territorial structure of the economy, of the properties of natural resources and ecosystems, of complex improvements of the natural environment, of man's adaptation to environmental changes, of the links of natural, technical and economic territorial systems and the health of the population serves as the scientific basis for the solution of the above-mentioned problems.

The study of these problems and its results — regional-differentiated programmes for the rational utilisation of natural resources and environmental protection — must rest not only on traditional methods of taking an inventory account and mapping the present state of the environment, but also on the data provided by a ramified system of observation posts and centres that permit obtaining dynamic data and series of maps on the basis of these data (monitoring).

A scientific programme for composite monitoring must record anthropogenous changes in the natural ecosystems and also the socio-economic factors that exert a mounting influence on the environment's state and changes in it.

The stations for such composite monitoring must be distributed unevenly and cover mainly areas where the environment undergoes the most active changes, for instance, irrigated oases, large man-made lakes, main industrial cities, industrial centres and clusters of such centres. At the same time, it is of the utmost importance to continue collecting standard data on the environment and also taking into account the changes taking place in the environment in the country as a whole and in its geographical subdivisions. It must be noted that for the solution of many problems linked with the rational utilisation of natural resources and with environmental protection the information that has been accumulated is still inadequate and must be supplemented with a study of the regularities governing the development of the spatial economic structure, of the human organism's reaction to environmental changes, of the stability of natural ecosystems to technical influences, and so on. It is necessary, above all, to study the mechanism by which the natural-technical ecosystems function, for this will make it possible to control the changes (and population density) of various areas of the environment. A major part of this problem is the study of the "metabolism" of industrial centres.

The solution of composite regional problems of the rational use of natural resources and the protection and transforming of the environment are linked with the choice of an optimal correlation between the short and long-term economic efficacy of economic measures. The choice must depend on the concrete changes in the geoecosystems under the influence of production. Moreover, the point of departure must be not only immediate benefits. This will only accentuate the negative influence on the environment and ultimately lead to greater losses in the future as a result of outlays to eliminate the consequences of these changes. But neither should the point of departure be based on future benefits, for this requires much too large material reserves.

A point that must be made is that if long-term planning is based on notions that a) there is an abundance of natural resources and b) that the existing forms of exploiting these resources are economically efficient, the implementation of such plans may spark snowballing disturbances of the geoecosystems. The transition to the category of obsolete technological relations is inevitable for many existing forms of the development of territory and the use of natural resources.

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The location of the main natural resources in the USSR is characterised by: an uneven distribution of individual kinds of resources, diverse productivity levels of these resources, and different territorial (regional) combinations of individual kinds of resources; unequal importance of the different regions as regards the concentration of natural-resource potential and its total magnitude.

Some idea of the uneven distribution of natural resources in the Soviet Union may be obtained from the first rough comprehensive assessments made by the Institute of Geography of the USSR Academy of Sciences as an attempt to determine the natural-resource potential that may be developed during the next 15-20 years. According to these assessments, the western regions have over 40 per cent of the Soviet Union's total natural resources potential (including 20 per cent in the south of the European part of the USSR and 12 per cent in the Urals-Volga region). More than 30 per cent of this potential is in the vast territory of Siberia and the Soviet Far East and about 25 per cent in Kazakhstan and Central Asia.

After the Great October Socialist Revolution profound changes were observable in the distribution of the productive forces as the socialist economy in the USSR developed. In particular, there was an acceleration of the economic development of many areas in the north, east and southeast that have large natural resources. This process is continuing. At present natural resources are being developed on a large scale in the north of the West Siberian plain and the south of Eastern Siberia; new industrial complexes and centres are springing up in Eastern Siberia and the Soviet Far East, in Western and Central Kazakhstan, and in the deserts and mountains of Central Asia.

At the same time, the considerable contrasts in the development level of the natural-resource potential persist and in some cases are becoming more pronounced. This is determined by social requirements, economic potentialities and the influence of scientific and technological progress. For that reason there are no grounds for forecasting (at least in the next 15-20 years) the even development of the entire territory and all the natural resources of the USSR.

Under developed socialism the diminution of the relative role of extensive factors and the movement of the centre of gravity of economic development to the intensified utilisation of existing capacities, water resources, old-tillage land, forests and so on foster the trend towards stabilising the main framework of the spatial

economic structure. For that reason, in its basic outlines the spatial economic patterns of the Soviet Union's territory will remain unchanged for the forecast period. In any case, it may be used as the basis for prognostications.

In the main regions of the USSR the changes in the environment and the resultant regional-complex problems are taking shape as follows.

North and central belt of the European part of the USSR. This region has a large proportion of the country's industrial, scientific and technical centres, scores of large cities and a considerable portion of the labour resources. The long-standing settlement of this region and the high concentration level of its productive forces account for its high development level (chiefly in the south and southwest) and the substantial modification of its natural landscapes. In the vast territory of the European North, where the utilisation level of the natural resources is lower, features of extensive development are still to be observed in the forms of settlement and economic development.

Taking this region's geographical features into account, the following problems in making rational use of natural resources and improving the environment may be regarded as the most important:

1. *Transition to intensive and a more comprehensive utilisation of key minerals*; utilisation of Pechora coal mainly for coking, the northern gas deposits for the extraction of condensate, the apatites of the Kola Peninsula for the production of nepheline concentrates, the iron ore of the Yana-Kovdor deposits for the production of phosphates, zirconium and rare-metal primary materials, and so on.
2. *Transition to the intensive utilisation of huge forest resources conveniently sited relative to consumers.* It is quite probable that during the next 15-20 years all the forest resources of this region will be brought into the sphere of intensive forest economy, and that the system of forest economy measures, particularly in the south and west of this region, will be more broadly oriented on the composite utilisation of forests, taking into account their water-conserving, sanitary and recreational functions.
3. *Intensified use of farmland.* Thanks to the measures that have been instituted for the further promotion of agriculture in the non-black-soil zone of the USSR, including the reclamation of excessively damp land, the wide use of chemical fertilisers and the enlargement of arable land, it will be possible to increase the output of grain to between 25 and 40 centners per hectare and of grass on cultivated pastures to between 40 and 60 centners per hectare.
4. *Improvement of the water economy.* In the region there are areas with surplus water resources adjoining watershed areas with a shortage of water. In the period under review it would probably be expedient to direct part of the run-off of the northern rivers to water-scarce areas.
5. *Creation of a regional system of environmental protection.* The increased "stress" on the natural environment as a result of the appearance of large-scale industries, huge clusters of urban populations, intensive agriculture and the need to improve the conditions of

life for the people require the implementation in this region of a priority programme for the protection of the environment. In particular, such a programme must provide for the transfer to other regions of industries with "aggressive" waste and whose technology cannot be qualitatively changed in the immediate future. The transmission of electric power from the eastern regions and the accelerated development of nuclear power engineering will help to check the development of large thermal power stations in the region (these stations are a major polluter of the atmosphere and the source of the "thermal pollution" of water systems). Environmental protection measures in the Baltic basin through close cooperation among all the Baltic states are of international significance.

6. *Promotion of recreation facilities.* The region's high level of urbanisation accentuates the need for zones of everyday, short-term and long-term rest, with the reservation for this purpose of large tracts of river banks, sea shores and lake-and-forest territory. In some cases, for instance, around large urban agglomerations and the suburban zones of the big cities, the recreational use of territory must evidently receive priority and, consequently, parks with the proper amenities and zones for summer and winter recreation will become the principal element of their cultural landscape. Great importance attaches to the multi-purpose use of territory. Suzdal, Kirillov and many other old towns are becoming centres of recreation.

At this point it must be noted that, generally speaking, the creation of specialised recreation areas and zones is an extremely pressing task. Here it is necessary to work out indicators of the efficacy of the recreation facilities that would make it possible to compare this branch of the economy with the sphere of material production.

The further tasks in elaborating the scientific foundations for the use of nature include an analysis of the prospective input-output tables in the utilisation of land. These tables must comprehensively show the spatial requirements of industry, agriculture, town building and recreation in each region.

Thus, in the given region priority must be given to the depelopment of the landscape of the future regulated by natural-technical systems with optimal environmental parameters and a carefully sustained equilibrium of ecological systems of the industrial, agricultural, forest economy and recreation type.

South of the European part of the USSR. This, too, is one of the country's principal regions in the level of its economic development and concentration of population. It is a major producer of foodstuffs and agricultural raw materials. Alongside raw material industries drawing upon local natural resources, it has large efficient heavy engineering, chemical and light industries.

All this has determined the high development level of this region's territory and the radical modification of its natural landscapes, with the exception of the mountainous part of the Caucasus and small areas in the Carpathians and the Crimea. The spatial resources for extensive development have been practically exhausted: the development of new production and non-production functions requires the redistribution of territory between industries.

Taking this into account, the following priority problems are raised for the south.

1. *Intensified use of agricultural resources.* The fact that in the Soviet Union this region has the most favourable combination of naturally fertile soil (chiefly black-soil), abundance of warmth, labour resources and a technical infrastructure makes it the most promising in the country from the standpoint of agricultural development. This must be taken into account in the development and siting of processing industry centres, an industry that will continue to grow. In this region irrigation is the principal means of enhancing the bioproductivity of the land. In many parts of this region, particularly in the Middle-Russian Highland, the Carpathian foothills, the Crimea, the Caucasian foothills and Transcaucasia it would be expedient to forecast the completion of systems of anti-erosion measures, including the introduction of special crop-rotations and methods of soil cultivation. The restructuring of the region's agriculture and the boosting of its productivity (an increase in grain production to between 40 and 70 centners per hectare) must be accompanied by the promotion of all components of the agro-industrial complex — processing enterprises, livestock fattening farms, refrigeration capacities, efficiency of transport.

2. *Rationalisation of the work of extractive industries.* The existence in this region of large resources of fuel and primary minerals (coal, iron and manganese ore, titanium primary material, oil, natural gas, salts, sulphur, etc.) makes it possible and expedient to continue their extraction on a large scale. However, in order to avoid large losses of fertile land, it is necessary in some cases to ascertain and weigh the possibility of replacing open-cut mining by underground mining with the employment of a qualitatively new technology.

3. *Solution of the water problem.* The contradiction between the growing demand for water and the limited water resources is becoming extremely acute in the region. Today, this region, which has only 4 per cent of the USSR's total river drainage, accounts for 27 per cent of its water intake and 26 per cent of its irretrievable water consumption. For that reason in the south of the European part of the USSR the replenishment of the water balance's intake is an extremely important problem that requires scientific and technological study. This problem may be solved by using the discharge of the Danube and the Volga, by directing part of the drainage from Western to Eastern Transcaucasia, and also of the northern rivers into, among other areas, the basin of the Dnieper.

4. *Creation of a regional system of environmental protection.* The fact that this region has a high population density and the most favourable natural conditions of life in the USSR makes environmental protection an extremely vital problem. The concentration of population and active environment polluting industries in the large agglomerates and industrial centres make them priority environmental protection objectives. The moisture deficit, the sparse network

of rivers and the drawn-out period of heat increase the value of the available water reservoirs and require measures for the protection of these reservoirs. On account of the scarcity of forests it is necessary to plant forest belts around the large city centres, mainly on recultivated developments, strongly eroded areas and other land that is hardly suitable for agriculture. Special concern must be shown for the forests in the Carpathians, the Crimea and the Caucasus. It would be expedient to orient the intensive forest economy mainly on recreation, water-protection and soil-protection. It is necessary to increase the number of mountain-forest reservations and to preserve sectors of natural lowland, forest-steppe and steppe landscapes for research purposes.

5. *Promotion of the nationally and internationally important recreation industry.* The Soviet Union's unique combination of natural conditions (coasts of warm seas, mountainous and hilly landscapes, and diverse mineral water resources) require the further development of large zones and complexes oriented on recreation facilities for the population and, partly, for international tourism in the south of the European part of the USSR, particularly on the coast of the Black Sea and the Caspian and in the mountainous areas of the Carpathians, the Crimea and the Caucasus. For this purpose it is necessary to reserve, protect and build amenities in some coastal localities and also large areas in the mountains.

A large part of the region must be regarded as belonging to regulated natural-technical systems of the agricultural, industrial or recreation type.

The Volga area and the Urals. Thanks to the abundance and diversity of its natural resources and its geographical location on the juncture of the main economic zones, this vast, heterogeneous region plays a key role in the USSR's economy. It has large industrial, scientific and technical centres and occupies a major place in key heavy industries (ferrous and non-ferrous metallurgy), the chemical and petrochemical industries, oil production and heavy engineering. Agriculture and timber-felling are highly developed.

The intensive development of the areas around the largest urban agglomerations, particularly close to the old mining centres, is highlighted by a considerable modification of the natural landscape. This is also true of the almost entirely ploughed forest-steppe and steppe areas of the Middle and Lower Volga, and the South Urals. However, the natural landscape has not been so strongly modified in the north of the region and in the semi-deserts of the Caspian area (Kalmykia).

The close bond of the region's economic complex with the utilisation of its natural resources has given rise to a number of fairly acute problems related to the rationalisation of the use of nature and environmental protection:

1. *Intensifying the composite utilisation of mineral resources.* The gradual depletion of the large deposits of oil, iron ore and other minerals, which gave rise to the major components of industry in the Urals and the Volga area, accentuates the need for intensifying the

utilisation of the region's fuel and mineral resources (the attainment of a higher rate of oil output at operating oilfields and stepping up exploration for new oil and gas deposits, the application of advanced technological patterns for the large-scale development of iron ore deposits, and so on).

2. *Transition to the intensive utilisation of forest resources.* This requires, in particular, the development of all forest resources (leaf-bearing species, firewood timber, waste), a reduction of the volume of timber-felling in old timber-felling areas and a more efficient utilisation of the forests in the Ob basin area and, possibly, in the Pechora basin. The forests in the settled and developed areas of the Middle and South Urals and also along the Middle Volga must be used for water and air protection.

3. *Transition to the intensive utilisation of agricultural resources.* The vast areas of arable land in the forest-steppe and steppe region with their fertile grey forest and black soils, their satisfactory amount of heat but unstable precipitation occupy a notable place in the country's land potential. The large possibilities for increasing the productivity of these areas may be realised by enhancing the efficiency of agriculture, by introducing, among other things, the entire range of anti-erosion measures. The utilisation of the bioproductivity of the areas of the Lower Volga that are rather hot and are subject to extreme precipitation fluctuations, frequent droughts and dry winds requires a switch to massive irrigation with the strict observance of scientific and technical norms. It is planned to increase the area of irrigated land in this region to 6,500,000 hectares, while the yield on irrigated land is expected to increase as follows: wheat to 25-30 centners per hectare, corn to 50-55 centners per hectare and rice to 35-40 centners per hectare. This will make it possible to double or treble farm output.

4. *Solution of the water problem in the Volga-Caspian area.* The increase of the consumption of the Volga basin's water by large industrial centres and the use of that water for irrigation in the Northern Caucasus and Western Kazakhstan will seriously affect the water balance of the Volga-Caspian basin. The change of the drainage regime by the cascade of hydroelectric power stations and the increased water intake in combination with the pollution of water adversely affect the Caspian's unique fish economy complex. In order to regulate the regime of the entire basin it may be necessary to divert into it part of the drainage of the northern rivers, for which purpose comprehensive scientific and technical preparations will be needed. However, it would be expedient first to utilise all the possibilities for regulating the drainage regime of the Volga through the most rational use of the hydroengineering structures available or under construction in its basin.

5. *Improvement of the water supply of the industrial areas of the Urals.* The inadequacy of the water resources in the industrial areas of the eastern slope of the Middle and Southern Urals and their further qualitative exhaustion on account of pollution by industrial waste adversely affect the economic development of some key

centres and the conditions of life for their populations. In this connection we feel it would be effective to impose the strictest limitations on the industrial use of fresh water and, primarily, the re-use of water, the building of new centralised systems of water supply and sewerages with efficient purification installations, and the diversion of part of the drainage of the largest basins of the western slope (from the Ufa and other rivers). It is particularly important to carry out a series of measures to prevent the pollution of the Kama basin's waters in industrial centres having large-scale chemical and petrochemical industries.

6. *Developing comprehensive programmes for the protection of the environment.* The concentration of petrochemical, chemical, metallurgical and pulp-and-paper factories, many of which had been built long ago, and also of giant thermal power stations in a few of the region's industrial areas and centres requires massive anti-pollution measures in the region. First and foremost, it is necessary to reconstruct technology and introduce improved purification systems at projects in direct proximity to densely populated areas. The question may be raised of strict limitations or bans on any increase of "polluting" capacities in large centres.

In the future a selective introduction of controlled natural-technical systems — industrial, agricultural and water economy — will be indispensable in those parts of the region where the "stress" on the environment is particularly great and where the consequences of anthropogenous influences are clearly negative. It is of great importance to expedite the fulfilment of the programme of anti-pollution measures in the Volga and Ural rivers adopted in 1972 by the CPSU Central Committee and the Soviet Government.

Siberia and the Soviet Far East. This huge region embraces nearly 60 per cent of the Soviet Union's territory. Its key natural resources include oil, gas, coal, hydropower, gold, diamonds, tin and some other non-ferrous metals, precious and rare metals, timber and furs. The region's national and international importance as a source of energy and primary materials is steadily growing. In the south of the region there are large industrial, scientific and technical centres (Novosibirsk, Krasnoyarsk, Irkutsk and Khabarovsk, to mention a few). The region plays an increasingly important role in the development of resource-oriented industries and also some branches of the heavy engineering and chemical industries. A high development level has been achieved by agriculture (in the south) and by the hunting, fishing and other industries.

There are glaring contrasts in the level of settlement and the economic development of the region's territory. In the southern zone adjoining the Trans-Siberian Railway large areas are occupied by towns and industrial enterprises. There are vast almost entirely ploughed areas. Timber-felling is carried on intensively in the taiga zone. In the rest of the region there are only a few centres of development, and enormous sparsely-populated and extensively developed or undeveloped expanses with practically unchanged or virgin nature. This specific distinctly differentiated territory poses its

own problems in the utilisation of natural resources and environmental protection.

1. *Comprehensive development of the West-Siberian plain.* The enlistment into the economic turnover of the colossal resources of oil, natural gas, timber and iron ore of the central and northern parts of the West-Siberian plain is of national importance. Here the increase in the output of natural resources (oil to 500-600 million tons a year, gas to 300,000-600,000 million cubic metres, and timber to 50-70 million cubic metres) must be accompanied by an intensification of the forms of utilisation — reduction of losses in the process of extraction, and the collection and use of waste. The inter-related development of various extractive and processing industries (in the south of the region) will make it possible to create integral networks of the infrastructure and help to improve the conditions of life for the population in the region's stern climate.

Close attention must be given to surmounting the negative consequences of marshland. It would be expedient to give effect to local reclamation projects, chiefly in industrial and populated areas. At the same time, it will be necessary to begin large-scale scientific and technical preparations for the drainage and development of large areas of marshland. This includes changing the natural run-off regime in the Ob-Irtish basin, particularly in connection with the diversion of part of the discharge to the arid regions of the south of Western Siberia, Kazakhstan and Central Asia. The completion of this project must, evidently, be adjourned to a more remote period.

2. *Transition to an intensive utilisation of the energy and other primary materials resources of the south of the region.* The further development of nationally important energy-consuming industries, the transmission of Siberian electric power to the Western regions of the USSR and the solution of a number of composite problems in the south of the Soviet Far East require a more intensive utilisation of the large coal basins (Kuzbas, Kansk-Achinsk, Irkutsk and others), the completion of the cascade of hydroelectric power stations on the Angara, construction of a hydroelectric power station in the basin of the Amur and the building up of power-generating capacities in the upper and lower Yenisei. More, there must be a balanced development of other elements of the territorial-production complexes — a further increase of timber-felling in areas with surplus forests, the building of energy-consuming enterprises, power transmission lines and transport network, and the development of the settlement systems.

The region's shortage of labour resources determines the choice of labour-unintensive and materials-intensive industries, and highly mechanised and automated technological patterns aimed at the fullest utilisation of primary materials and waste. These patterns are expedient in the production of critical materials and in the interests of environmental protection.

3. *Further development of the extraction and primary processing of valuable raw materials in the north of the region.* The country's great demand for many kinds of natural materials, of which there is an

abundance in the northern areas of Siberia and the Soviet Far East, dictates the need for preserving existing and building new centres of the extraction and processing of non-ferrous metal ores, diamonds, mica, asbestos and so on. In some cases the cluster location of such centres in isolation from the main communication arteries requires the building of certain auxiliary industries (hydroelectric and atomic power stations serving factories). However, due to the rigid natural conditions it would be expedient, where possible, to limit the numerical strength of the permanent population in the industrial settlements of the Far North while improving the conditions of life by creating an artificial regulated environment (projects for such settlements are being drawn up).

The building of the Baikal-Amur Railway, the surmounting of the transportation isolation of the southern and central part of Yakutia and the link-up with foreign markets will accelerate the development of the Aldan iron ore, the Chulman coking coal and the Vilyui natural gas deposits.

4. *Further enlargement of the agricultural base.* The mainly poor conditions for agriculture east of the Yenisei make the individual tracts of relatively more fertile soil extremely valuable and require an improvement of the methods of using them. The most important are the forest-steppe and steppe of the south of Siberia, where it is vital to improve agriculture by, among other things, draining marshy areas and irrigating arid land. In order to increase the productivity of the Far Eastern centres of agriculture measures must be taken to reclaim land and prevent floods.

5. *Reinforcing the protection of valuable biological resources.* The region's huge taiga and tundra expanses and seas of the Pacific Ocean have resources of fur-bearing and sea animals that are unique on a global scale. The maintenance of economically effective game preserves requires a comprehensive biological and ecological programme for the protection of these animals, the creation of the conditions for their reproduction, control of hunting and broader international cooperation in this sphere.

6. *Comprehensive environmental protection programmes.* The specifics of the region's development allow implementing in the foreseeable future mainly localised zonal environmental protection programmes oriented on the protection of individual units that occupy a relatively small portion of the total area, with due regard for their broader ecological links. These units are the main industrial areas, centres and urban agglomerations (Omsk, Novosibirsk, Kuzbas, Krasnoyarsk, Irkutsk-Cheremkhovo, Norilsk and so on).

The priority development of the power industry makes it possible to electrify a large proportion of the high- and low-temperature processes, including the communal services, which will sharply reduce the smoke content of the air basin of cities.

The programmes provide for the protection of unique natural preserves, one of which is Lake Baikal. There it is necessary to carry out all the measures envisaged in the above-mentioned decision on the protection of the environment. The experience of implementing these

measures, which are unprecedented for their scale, will be used in planning economic development in optimal interaction with the environment in other regions of the country.

Thus, in the given region the selective building of controlled natural-technical systems — industrial, forest economy, agricultural — will be combined with the preservation of extensive forms of utilising nature and large reserves of undeveloped territory.

Kazakhstan. This huge region, which occupies about 12 per cent of the USSR's territory, is situated mainly south of the main latitudinal economically developed axis: it has large natural resources — ores of many non-ferrous, rare and ferrous metals, coal, phosphorites, oil — and large tracts of arable land and natural pastures. There are large industrial complexes and centres of national importance in which the mining and processing of natural materials predominate. Moreover, this is a major grain and livestock region.

The development of territory and the extent to which the natural landscape has been changed are extremely uneven in the region: centres with a high concentration of mining and processing industries with towns and townships, zones of continuous or almost continuous ploughland in the forest-steppe and steppe, areas of intensively irrigated and partly bogar (well) agriculture in the oases and foothills of South Kazakhstan combined with sparsely-populated expanses and vast, extensively used seasonal pastures.

Kazakhstan's economic development is closely linked with the utilisation of its natural resources and the state of the natural environment. For that reason the rational use of nature is a pressing, complex economic problem in this region.

1. *Transition to the intensive overall utilisation of mineral resources.* Here, as in other mining areas, it is vital to reduce losses in mining and concentrating mineral primary materials. The complex character of many kinds of ore requires the fullest possible extraction not only of basic but also of accompanying components. However, the development of processing in this region and the building of industrial centres are limited by the difficult problem of ensuring a water supply.

2. *Transition to the intensive utilisation of the agricultural resources of the forest-steppe and steppe.* The stabilisation of the development area of former virgin and disused land and of the economies and population centres built on that land creates the conditions for intensifying production and the accompanying anti-erosion measures (agrotechnical, forest-improvement, and so on), the cultivation of salt-marshes and saline soils, the introduction of crop-rotation and the exclusion of erosion-prone light soils from ploughing and the regrassing of these soils. The unstable precipitation regime and other unfavourable specifics of the region's continental climate reduce the economic value of its land. In order to surmount radically the instability of the crop yield (as a consequence of frequent drought) and also to provide all the economic units with a normal water supply it is necessary to solve the acute water problem, a problem

that is only partially settled by the building of a system of trunk pipelines.

3. *Improving the use of irrigated land in South Kazakhstan.* In order to increase the output of heat-loving crops — rice, cotton, fruit, vine, vegetables — it is necessary to promote the effective development of irrigated farming in the south of the region by a fuller utilisation of local water resources (Syr-Darya, Ili and other rivers), employ advanced agrotechniques and implement land-improvement measures to prevent the salination and erosion of irrigated land.

4. *Transition to a more intensive use of natural pastures.* The completion, in the immediate future, of the extensive development of the entire area of pastureland through a broad irrigation scheme places on the agenda the rationalisation of pastureland livestock-breeding and the further enlargement of the centres of a more intensive economy, notably field fodder production.

5. *Solution of water problems.* Already today the water shortage is holding up and in future may even more adversely affect the development of the leading branches of Kazakhstan's economy. The shortage may be partly overcome by a more rational utilisation of all local resources, including the tapping of subsoil waters, the distillation of saline waters and so on. The channelling of the waters of the Irtysh, Tobol, Ishim, Ural and other rivers to the region's hinterland by means of canals and pipe-lines, and the building of local systems of distilling sea water (Mangyshlak) may prove adequate for the solution of the problem of water for industrial, household and agricultural use in limited areas. However, the switch to massive irrigation in the zone of unstable precipitation regime will require the channelling of water from other regions. This project must be preceded by comprehensive scientific and technical preparations, including an analysis of immediate and long-term consequences.

6. *Comprehensive environmental protection programmes.* The cluster distribution of industries makes it possible to concentrate the basic environmental protection measures in individual areas, chiefly in the main industrial centres. At the same time, it may possibly be necessary to use individual sparsely-populated areas of Kazakhstan, chiefly the depressions (natural enclosed valleys) that have no run-off as the sites of some noxious industries moved from the densely-populated western areas. Of course, these measures must rest on careful planning and sanitary considerations.

Thus, in Kazakhstan the orientation should be on a selective building of controlled natural-technical systems — industrial and agricultural — in conjunction with a relatively extensive and better organised utilisation of the bulk of the territory.

Central Asia. This is a fairly hot region with extremely valuable agricultural resources for the massive production of heat-loving crops. Its resources of natural gas, oil, rare metal ores and hydropower and its desert and mountain pastures are of considerable economic importance. The large natural-resource potential, the

rapidly growing population and the availability of labour resources create the conditions for the region's swift economic advancement in the future.

Its territory is unevenly settled: the population and economic activity are concentrated in the relatively small oases in the intermountain hollows and in the foothill plains. The building of new irrigation networks has led to an enlargement of the agricultural areas in the Golodnaya Steppe, Central Ferghana, the Vakhsh Valley, the Karsha Steppe and elsewhere. The main industrial centres are in the old and new oases. As a result, there is an extremely high concentration of productive forces and this imposes a "stress" on the natural environment in the oases. Outside the oases there are relatively small centres of intensive development in individual mining areas. Most of the region's territory — the deserts of the Turgan lowland — is devoid of accessible water resources, while the Tien Shan and Pamir-Alai mountain systems are extensively developed and almost unpopulated.

The present state of the region's economy and the prospects for its development are closely linked with the natural environment, which gives rise to a number of specific problems of its rational utilisation.

1. *Rationalising the use of irrigated land.* Central Asia's irrigated land is of immense importance to the economy. There the considerable headway in irrigation is sometimes accompanied by negative consequences — repeated salination, the emergence of marshland, irrigation erosion of soils and deterioration of the quality of subsoil and surface waters. In general outline the measures that have been taken to eradicate these side-effects are well known, but the considerable heterogeneity of natural conditions requires a differentiated application of these measures.

In view of the growing demand for cotton, rice, vine and vegetables it is necessary to extend irrigation to new expanses of land. The potentially suitable reserves for this are quite large. A very big portion of the prospective areas has complex melioration conditions with the result that large outlays must be made for building long trunk canals, roads and new industries and settlements. The massive irrigation of large expanses of new land may aggravate the water shortage. For that reason the efficacy of irrigation projects must be economically substantiated.

2. *Improvement of pasture land.* The development of practically all the desert and mountain pastures and the steadily increasing stress on them as a result of the growth of the livestock population necessitate a broad (and quickly repayable) switch to the reconstruction of pastures — to improved watering, the formation of insurance centres of small-oasis agriculture, improvement of the system of routes and livestock roads and an improvement of grass stands.

3. *Solution of the water problem.* The aridity of the region makes the problem of water supply of decisive significance. Although irrigation remains the principal element of irretrievable water consumption, the rapid development of industry and settlements is increasing the demand for water. The priority task is to improve the

organisation of the use of available water resources. This aim is served by hydro-engineering installations which, in addition to generating electricity, regulate the drainage regime in the mountains, i.e., in the area feeding the main river basins. The system of canals, of which the largest is the Kara-Kum Canal (1,400 kilometres), allows redistributing the water resources among the basins in accordance with the location of the cultivated land. The experiments in regulating the melting of mountain glaciers, which feed the main rivers, merit attention. Use must also be made of other sources and methods, in particular, the distillation of saline subsoil and sea waters with the aid of natural cold and solar and atomic power installations.

4. *Implementation of comprehensive environmental protection programmes.* The high "stress" on the natural environment in intensively developed oases and the inadequate stability of the region's natural complexes result in a "chain reaction" of the negative consequences of technical influences on nature (violation of the water-salt regime of the soil and of the subsoil drainage regime, and pollution of subsoil waters, soils and the atmosphere by mineral fertilisers, chemical pesticides, defoliants and other substances). All this requires further measures to protect the environment. These measures are all the more necessary in view of the fact that most of the region's population is concentrated in areas where natural environment has undergone the greatest changes.

Industries that account for the greatest pollution of water and the air basin must be gradually moved out of densely-populated areas, especially from water-hungry hollows and windless zones. Regulation of the flow of irrigation and drainage water permits controlling the most dynamic factor changing the environment.

Some mountainous territories with a moderate climate, pure air and forest vegetation should be reserved for recreation purposes. In this respect the basin of the mountain Lake Issyk-Kul and the mountain valleys of the Tien Shan near large cities merit special attention. Considerable benefit will be derived from the creation of preserves and national parks in mountains and deserts.

The selective building of networks of controlled natural-technical systems — agricultural, industrial, recreation — will be necessary in the future in areas with the highest concentration of productive forces. The continuation of relatively extensive development must be expected in most of the sparsely-populated deserts and mountains.

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Such are the major constructive regional problems linked with rationalising the use of natural resources and protecting and improving the environment in the USSR. Their solution on the basis of a composite approach will ensure an account of the totality of natural and economic factors, which differ sharply in the country's vast territory, and it will help socialist society to carry out its socio-economic tasks with the greatest efficiency.

Changes in the Atmosphere and Some Problems of Its Protection

FEOFAN DAVITAYA

AIR POLLUTION BY AEROSOLS

The Earth's atmosphere has become greatly polluted in recent years, measurements made in cities and industrial centres showing a considerable rise, year by year, in the content of various gases and aerosols. At considerable distances from cities and industrial centres the atmosphere's aerosol content is reduced by a factor of several hundred and even some thousand, but even there considerable quantities of aerosols are present.

It was once thought that the ever greater amount of dust in the atmosphere was the result of the growing unsystematic ploughing of land, the felling of forests, and the growth of woodless spaces, the spread of steppe land at the expense of forests, and of desert land at the expense of steppes, the development of cities, transport, energy installations, the extractive and manufacturing industries, as well as the growing meridional component in the overall atmospheric circulation during the last fifty years.[1]

All over the world there have appeared a vast number of research papers in which various indirect methods have revealed the erroneousness of the still existing idea that air pollution is to be met only in cities and industrial centres. As a result of the circulation of the atmosphere and the turbulent currents in it, air pollution has become planet-wide in scope, involving almost the entire troposphere.

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Vast and irreparable changes in the natural environment are being caused by air pollution. The dust pollution disturbs the thermodynamic state of the atmosphere, and produces undesirable changes in climate and other associated natural conditions. In certain measure, the higher dust content in the troposphere can make climate warmer, this for three main reasons: the direct heating of the air by dust, which absorbs short-wave radiation; the retarding of long-wave radiation (which can be called hothouse effect), and the resulting greater turbulent mixing in the lower layers of the atmosphere. Contrariwise, any increase over a definite concentration of dust in the atmosphere can lead to a cooling down of climate in consequence of the screening of solar radiation.[2]

Dust aerosols that settle on glacier surfaces reduce their reflective power and destroy them by speeding up the melting of ice accumulated over the centuries, this by absorbing ever greater quantities of solar radiation. Air pollution has a negative effect on vegetation, agricultural productivity, and even industrial development, especially in such advanced industries as the semiconductor, optical, photochemical and the like.

Pollution of the atmosphere is detrimental to human health since admixtures in it contain many toxic substances, some of which are carcinogenic. It should be remembered that man consumes a daily average of about one kilogram of food, two litres of water, and twenty-five kilograms of air. The choice of food and water depends on their quality and taste, but air cannot be chosen. It is to be regretted that hardly any detailed studies as yet exist into the gradual and systematic influence exerted on man's health by the overall content of dust in the atmosphere and its chemical composition; the few exceptions refer to extreme pathogenic instances (pneumoconiosis, occupation poisoning by volatile substances, and so on).

The global pollution of the atmosphere will probably gain momentum within the next decade unless decisive steps are taken on a broad scale. It is a question of cleaning the atmosphere of injurious admixures and restoring the disturbed natural complex. Despite the vastness of this task, it can well be accomplished if the hypothesis of the causes of the present-day pollution of the atmosphere is correct. The following would seem the necessary measures to be taken: an end to the irrational felling of forests, reforestation of steppe-land and mountainous areas; creation of field-protective forest stands; recovery of desert land so as to create productive soil protected by defensive belts; creation of parks and green spaces in cities and villages, with rationally selected kinds of vegetation extensively used; introduction of a system of land cultivation that will prevent wind erosion.

The restoration of destroyed vegetation cover and its further enrichment will solve another problem characteristic of present-day civilisation, which may arise in the immediate future, i. e., atmospheric oxygen, thousands of millions of tons of which are consumed annually. We all know that the vegetation cover plays an

important part in restoring the oxygen in the atmosphere through photosynthesis. So vast is the oxygen content of the atmosphere that its ever growing depletion has not yet affected the composition of the air. However, the inevitable and ever growing use of oxygen in coming years may, as we shall now show, create a shortage of it. Vegetation, which "operates" in a close cycle in the global system of the biosphere, will not add any free oxygen, but may intensify the physico-geographical process.

Meteorological offices in all developed countries, including the USSR, have in recent years been making a detailed study of air pollution in industrial centres.

To counter industrial pollution of the atmosphere, high factory chimneys are being built in a number of countries, this on advice from scientists. This measure has proved useful because higher chimneys mean greater wind speeds in the lower layers of the atmosphere, and concomitant turbulent mixing. Besides, such structures are cheaper than other measures to protect the atmosphere. In some countries, calculations have been made of the advantages accruing from following the advice of meteorological offices regarding the erection of high smoke stacks: the difference in the cost of high factory chimneys and purification installations is multiplied by the total number of industrial enterprises, this revealing tremendous savings. In fact, however, this approach means self-deception, not a solution of the problem. By removing industrial waste from a particular locality, high factory chimneys pollute areas hundreds of kilometres away. A territory is polluted by industrial waste from adjacent areas. Besides, industrial waste products settle on the ground and then rise into the air time and again, thus continually increasing atmospheric pollution. Minute admixtures of smoke and gases are constantly suspended in the atmosphere; periodical washing of the air by rain makes it relatively clean only for short periods, which is why the self-cleaning of the atmosphere should be understood only in a conventional and limited sense, whilst factory chimneys are nothing but palliatives.

Clean air in urban areas requires a decrease of, and ultimately an end to, the ejection into the atmosphere of vast quantities of smoke and other products of combustion by industry, transport and domestic devices.

What is called for in the foreseeable future is the construction of stackless factories operating in closed technological cycles, with the full recycling of all industrial waste. With the present-day and prospective state of science and technology, high-grade food and textiles can be produced from the smoke and gases that are now being ejected into the atmosphere and poison it.

As we all know, living Nature, and in the first place man, has achieved the highest degree of organisation in the world. Nature operates without any waste products. What is rejected by some organisms provides food for others. The organisation of industry on this principle — with the waste products of some branches of industry

providing raw material for others — means in effect using natural processes as a model, for in them the resolution of all arising contradictions is the motive force of progress.

The refashioning of industrial processes thus acquires tremendous importance at the present stage of human activities, not only in keeping the atmosphere free of harmful admixtures but in maintaining the gas composition of the air at a constant level.

OTHER KINDS OF POLLUTION

The following may also be conventionally included among factors of atmospheric pollution: the strengthening of the electromagnetic and changes in the gravitational fields; the increase in the general background of vibration and noise to extreme magnitudes in excess of permissible standards; the decrease in ultra-violet radiation (by about 30 per cent in the open air) both as a consequence of air pollution by hard and liquid aerosols, and of people spending most of their time indoors — at home, at work, in transport vehicles and so on.

To all this might be added the hypodynamia so characteristic of our times, as a result of an insufficient physical activity connected with the use of present-day technology, and also of the high nervous stress created by the rate of present-day life.

Industry today calls for the consumption of vast amounts of electricity produced at thermal, hydroelectric and nuclear power stations. Energy is transmitted along high-tension lines, thus strengthening the electromagnetic field. The intensity of field varies depending on the voltage applied, but given a tension of 500,000 volts typical of modern transmission lines the background of the electromagnetic field exceeds the permissible standard in a two-kilometre zone along the entire length of such lines.

Another area calling for detailed study is the use of electric transport of all kinds in cities, and especially the replacement of petrol-burning automobiles by those run on batteries. Experiments in this field are being conducted in all industrially advanced countries, the solution of this problem being considered of great significance in combating air pollution. However, it may prove that one kind of pollution will yield place to another.

The creation of territorial-industrial complexes and the concomitant concentration of production leads to large numbers of people being concentrated in limited areas, this calling for the construction of high-rise buildings both for industry and habitation. People ascend and descend distances of up to a hundred metres and even more by travelling in lifts, thereby substantially changing the effect of the gravitation field on man, and of the atmospheric pressure that goes with it.

The operation of plants, motors and engines of various kinds, and

high speeds of traffic create an excessive background of noise and vibration. The vibration background may also be increased in some measure by the microseisms caused by the overall impact of present-day industrial enterprises on the Earth's crust. This is a problem that calls for special study: people come into contact with vibration sources with frequences of 10 to 12 cycles per second, lengthy exposure to which is in excess of permissible standards.

Noise levels in streets in big cities now reach 80 decibels, sometimes even 110 decibels, which exceeds the highest permissible standards. It should be remembered that 130 decibels is considered a dangerous threshold, beyond which the hearing is damaged. During the last decade, the mean noise level in big cities has risen by 10 to 12 decibels, reaching 40 to 50 decibels. There have been forecasts that this level will rise by 1 decibel yearly unless the necessary steps are taken.

Data exist showing that normal functioning of the human organism may be impaired by lengthy exposure to strong electromagnetic and acoustic fields, by frequent changes in the gravitation field, and by strong vibrations.

The cumulative impact of various unfavourable factors of this kind intensifies anomalous processes and leads to various pathological phenomena that cause highly dangerous illnesses. This is not only a medical problem but a socio-economic one as well.[3]

The rising temperature of the environment is also a factor of air pollution, especially in big cities, in many of which the mean temperature of the air has for many years stood between 0.5°C and 1°C higher than in adjacent localities. In some cities, the difference is almost 2°C. As a rule, this temperature rise in big cities is greater in summer and lower in winter. The formation of such heat "islands" stems from a number of causes, of which the following are the most significant: the lower expenditure of heat on evaporation in cities — although precipitation is higher there, it rapidly finds its way into the sewerage system, and plant life is insignificant; the lesser velocity of wind as a result of the tall buildings there; the lower effective radiation of the Earth's surface as a consequence of the absorption of long-wave radiation by hard and liquid aerosols; the increase in artificially produced energy. There are also other causes, but these are of less significance.

Thermal pollution is of global significance among the indirect factors of the change in the atmosphere's natural characteristics. In this respect, the cities of today can provide a model of possible global climatic changes brought about by man's activities. There are grounds to believe that atmospheric pollution by industrially produced aerosols and gases will become stabilised or reduced within the next few decades as a result of measures taken. At the same time, the artificial production of energy will grow. At present its magnitude for the whole planet has been estimated at 0.01% of the energy received from the sun, but it is showing an annual growth of about 6%, with

prospects of a further rise in the foreseeable future, which means that the time is not far off when artificially produced energy may prove a substantial supplement to solar radiation.

THE PROBLEM OF FREE OXYGEN

For a lengthy geological time, the Earth's atmosphere remained constant in respect of its gas composition; at least, it was constant during the Quaternary Period. However, its carbon dioxide content has risen over the last few decades.

The question of the origin of free oxygen has not yet been finally answered, with most scientists holding that at least its greater part has been a product of terrestrial and marine vegetation. In this, a dynamic balance has been established in the biosphere: no matter how much oxygen is isolated (mainly in the process of photosynthesis and also from the photochemical decomposition of water vapour in the upper layers of the atmosphere) the same amount is absorbed through respiration, putrefaction and by the numerous oxydising processes continuously taking place in the environment. A mere 0.00007% annual excess of free oxygen isolation over its consumption could have led to its total amount becoming doubled only during the present, Quaternary Period of the Earth's history. A 0.003% oxygen decrease a year would have led to its almost complete disappearance during the same period.

Free oxygen has also been used for artificial combustion since the time man emerged from his natural environment and learned to produce fire. This process has not been made up for by the release of oxygen during man's productive activities in the same way as the oxygen consumed in Nature is replenished. The additional consumption of oxygen as a result of the development of modern civilisation and the rapid growth of all types of industries has reached vast proportions.

It is common knowledge that a fall in the partial pressure of atmospheric oxygen by one-third leads to oxygen lack, a decline by two-thirds threatening lethal consequences. If we accept that future consumption of oxygen will remain at the present level, i. e., that its annual depletion will stand at 10,000 million tons, then two-thirds of the total amount of free oxygen in the atmosphere and hydrosphere will be used up in a little over 100,000 years.

If the annual increase in the present consumption of oxygen is allowed to stand at only 1 per cent, a period of about 700 years will suffice for it to fall to a critical concentration level. If such consumption goes up by 5 per cent a year, that period will fall to 180 years, and to 100 years if consumption goes up by 10 per cent.

It may be asked how real the prospect is of an annual increase in oxygen consumption by an average of 1, 5 or 10 per cent. The reply to that question depends on world fuel production, whose course is shown in the following table:

Table I

World Fuel Production (in round figures)

Kind of fuel	Years			Annual increase during the periods (per cent):			
	1940	1955	1958	1967-1969 (1969 for USSR; 1967 for rest of world)	1940-1958	1958-1967-1969	1955-1967-1969
Pit and brown coal (million tons)	1,200	—	2,430	2,900	5	2	—
Petroleum (million tons)	310	—	910	1,650	10	8	—
Natural gas (000 million cubic metres)	—	390	—	850	—	—	9

As can be seen from the above figures, the rate of increase in the extraction of coal as against petroleum and gas shows a decline, although coal reserves are enormous. As for petroleum and gas, their extraction has risen sharply during the last two decades. Even if the annual growth rate for the extraction of these types of fuel is stabilised, it still stands at a fairly high level (about 10 per cent). Of course, the rise in oxygen consumption is the same as for fuel extraction.

Judging by the above figures, the rise in oxygen consumption by an average of 10 per cent for all kinds of fuel seems quite realistic. Moreover, we should bear in mind not only the present growth rates of industry in developed countries, but also the fact that the developing countries are beginning to follow their way.

Thus, any direct extrapolation of present-day conditions into the future will lead up to the conclusion that mankind is constantly modifying its environment. It is common knowledge that each new geological era was shorter than the one it has succeeded. While the Archean Era, the most ancient, lasted 900 million years, the Proterozoic Era that followed it lasted 600 million years, the Paleozoic—325 million years, the Mesozoic—115 million years, while the Cainozoic Era has been lasting 70 million years. However, the Cainozoic Era will also come to an end, this process being

accelerated by Man, that acme of creation, who has appeared during the last million years.

Though these concepts seem indisputable, the above calculations and any extrapolation of present-day conditions into the future are not founded, as the following considerations will show.

The known reserves of combustible raw materials are insufficient for two-thirds of the free oxygen in the air to be consumed. Prospected coal reserves to a depth of 1,800 metres have been estimated at 14,947,400 million tons,[4] natural gas at 180-200 · 10^{12} cubic metres[5] and oil at 400,000 million tons.[6] In terms of oxygen consumption, all this provides a total of 29,721,800 million tons, or 0.5 per cent in volume. However, this argument is not very convincing. In the first place, estimates of geological reserves may change by several orders in the passage of time. It has been calculated that about 6 · 10^{15} tons of organic carbon lie below the Earth's surface, an aggregate whose combustion would require ten times as much oxygen as is contained in the atmosphere and the hydrosphere. Secondly, some new fuel may appear within the next few decades, which will call for more intense oxygen consumption than is required for coal, oil or gas. Another and more cogent argument is the power of human intellect, for it is hardly possible that mankind will permit the further course of events to follow the scheme set forth above, and will surely preserve the stability of the gas composition of the Earth's atmosphere. However, the time has come for measures to be envisaged and for their systematic implementation to be launched. That should in no way be taken to mean that the development of the productive forces should be slowed down and that man's creative activities should be restricted. That would be not only impossible but even inadvisable. Efficacious means should be sought to utilise energy sources that do not require any consumption of oxygen and do not increase the carbon dioxide content of the atmosphere. Though nuclear energy solves that problem, the wastes from its production present no less danger to the biosphere than a change in the atmosphere's gas composition.

One can consider most promising the utilisation of solar radiation and its efficient conversion into various kinds of energy. Other roads of mankind's energy re-equipment do not eliminate the problem of a negative effect not only on the biosphere but on Nature as a whole. It has frequently been pointed out in scientific literature that, given the present-day rates of increase in the production of artificial energy, the amount of heat emitted in various industrial processes will, in less than 100 years, reach a magnitude comparable with the amount of energy our planet receives from the sun. That cannot but lead up to a substantial overheating of the Earth, with all ensuing consequences. Glaciers will melt away and the level of the world's seas and oceans will go up by 64 metres. The climatic and water regime of the terrestrial surfaces will change entirely. However, all these consequences can be avoided if the necessary measures are taken in good time.

Vast importance attaches to the creation of industries in which material production will absorb carbon dioxide and emit tens and

hundreds of milliards of tons of free oxygen in the form of industrial waste. As pointed out above, the great contradictions arising between man and the rest of Nature can be resolved through the organisation of industry in closed yet developing cycles, in the same way as the substance-energy cycle is progressively effected in Nature.

THE SOCIAL ASPECTS OF THE PROBLEM

The protection of the atmosphere against emerging changes is not merely a scientific and technological problem. Human activities tend towards boundless development, yet though that process should be encouraged in every possible way, it should be guided along an optimum direction. The ever growing creation of material values is accompanied, on the one hand, by the expansion and modernisation of industry, and, on the other, by the latter's spatial concentration. Cities are growing apace to form conurbations, which, in their turn, are showing a trend towards expansion. The spatial concentration of industry is economically advantageous because it encourages commodity production. Suggestions have been made to expel industry from the cities, something that is unfeasible in many instances. Besides, industrial development is unthinkable without a working class, engineering personnel, schools and universities, research institutions and theatres, hospitals, governmental and managerial institutions and without modern transport and other means of communication, and many other things that go to form the infrastructure of present-day cities.

The uncontrolled development of this process leads to vast sprawling cities that are inconvenient to work and live in, as is exemplified by many capitalist countries. Smog and other results of photochemical interactions are common in such cities as New York, Los Angeles, Tokyo, and central Rome, where there is a shortage of oxygen during certain hours of the day in calm weather. The situation will become general unless the necessary steps are taken, based on an optimum and long-term social strategy in the development of the economy. Instead of dispersing industry outside cities, the necessary conditions should be established within the latter, this calling, in the first place, for the construction of purification plants at factories and then going over to closed industrial cycles. The neutralisation of exhaust gases from automobiles and other transport vehicles is just as urgent. Important among the measures required to clean the air of injurious admixtures is the extensive planting of greenery in factory shops and yards, in streets and city squares, and the creation of parks, gardens and tracts of forest lands both within and around cities.[7] USSR hygiene standards demand that there should be no less than twenty-five square metres of greenery for each urban dweller, plant species to be selected according to their ability to absorb harmful admixtures from the atmosphere. In this connection various kinds of

plants differ greatly, the amount of admixtures they can absorb varying within a very wide range.[8]

All this requires extra expenditures, which will of course affect the cost price of industrial goods. That is why the implementation of such measures is possible only in conditions of state planning. At all events, it means lower profits, which, in conditions of private enterprise, is made up by greater exploitation of the working people, this in turn exacerbating class contradictions in capitalist countries.

In a socialist society it is the state that assumes the main burden of expenditures on environmental protection. In the Soviet Union, substantial results in improving the environment have been achieved in such big cities as Moscow, Leningrad, Kiev and Baku. Installations for trapping and cleansing smoke and other emitted gases, as well as for the purification of sewage, have been built at many big industrial enterprises, where effective systems for the re-use and recycling of water have been set up. The area of greenery per inhabitant of Kiev is 25 sq. metres (which is within the standard); in Moscow, that area is 45 sq. metres.

The adoption of a complex of measures in Moscow, for instance, has considerably lowered the amount of admixtures in the air in the last few years: dust has been reduced by 50 to 60 per cent, sulphur dioxide by 60 to 70 per cent, carbon monoxide by 70 per cent, and so on. The Moskva River, which flows through the capital, has become much cleaner and is now stocked with fish, as is illustrated by the number of anglers to be seen along its embankments. It has been generally noted that Moscow is one of those rare cities where a white collar will remain white throughout the day. Moscow's industries are developing and the number of automobiles of all kinds is constantly increasing, yet the environment is becoming cleaner and healthier.

The common efforts of scientists working in different fields of knowledge, both natural and social, are playing an ever greater part in the solution of environmental problems in the USSR. For instance, 24 research institutes and higher schools took part in drawing up the appropriate sections of the complex plan for the economic and social development of Leningrad for 1976-1980. Presidium of the Academy of Sciences of the Ukrainian Soviet Socialist Republic has approved a programme of work on the complex problem of "Science and the Cities", in which many institutes under that Academy are taking part. The programme includes a corresponding plan of research work and its practical implementation. "It is first and foremost a question of drawing up and introducing effective scientific recommendations designed to create new or modernise existing technological processes, and of reducing levels of noise, vibration, the influence of electromagnetic fields and other injurious changes in man's environment," wrote K. Sytin, Vice-President of the Ukrainian Academy of Sciences.[9] An automatic system for the control of air pollution in cities has been developed at institutes under the Ukrainian Academy. It is to be introduced in Moscow, Leningrad, Kiev and other industrial centres.

* * *

The protection of the atmosphere against pollution cannot be effected within the framework of national programmes alone, for the atmosphere knows no state boundaries. Polluted in one country, the atmosphere can cause economic damage in other countries whose inhabitants have to breathe such contaminated air.

In conditions of developed international trade, approximately equal charges should be instituted to be spent on environmental protection. This refers first and foremost to the atmosphere, the world's seas and oceans, and common expanses of water (internal seas, lakes and reservoirs and also rivers running through more than one country). That is why the protection of the atmosphere and other components of Nature calls for multilateral international agreements and their strict implementation.

NOTES

[1] See F. Davitaya, "On the Possible Effect of Dust in the Atmosphere on Reducing Glaciers and Making Climate Warmer", *Transactions of the USSR Academy of Sciences, Geography Series*, 1965, No. 2 (in Russian).

[2] Ibidem.

[3] For more details see G. Tsaregorodtsev, "The 'Technicalised' Environment, and Human Health", *Social Sciences*, No. 4(14), 1973.

[4] See M. Ravich *et al.*, *Metallurgical Fuel*, Moscow, 1965 (in Russian).

[5] Ibidem.

[6] See *The World's Petroleum Industry*, Moscow, 1966 (in Russian).

[7] It should be noted that the present-day level of atmospheric pollution leads to the amount of dust in the atmosphere varying considerably in different parts of a big city: a cubic centimetre of air in the industrial area contains several millions of hard and liquid particles with radiuses of fractions of a micron or less. The dust content in business quarters is reduced by a factor of several dozen and in parks by a factor of several hundred.

[8] See S. Durmishidze, D. Ugrekhelidze and A. Djikiya, "The Assimilation and Conversion of Toluol by Higher Plants", *Prikladnaya biokhimiya i mikrobiologiya*, Vol. X, Issue 5, Moscow, 1974.

[9] *Izvestia*, June 17, 1975.

Theoretical Geography

VENIAMIN GOKHMAN

One of the results of the scientific and technological revolution is the revision of the traditional concepts concerning the place and practical value of various sciences. Geography, for instance, has once again, after a long interval, taken its place among the fundamental sciences. This is due primarily to the accentuation of a series of problems connected with the need to improve the territorial organisation of the entire activity of human society, including rational utilisation of natural resources and protection of the environment. An important place in the solution of these problems belongs to the system of geographical sciences.

The aforementioned circumstances have greatly increased the theoretical and practical significance of a number of trends in geographical research, notably such as: the comprehensive study of natural resources and of the complicated problems concerning the rational utilisation and remaking of nature, the impact of the scientific and technological revolution on the environment and, based on this, the forecasting of further changes in the environment, and the elaboration of scientific guidelines for the exploitation of nature and protection of its resources. The specific role of geography in the accomplishment of these tasks is self-evident.

Another important trend in current geographical research is connected with the fact that scientific and technical progress is impossible without the management of science and production. An important element of this trend is therefore the territorial organisation of the productive forces which is embodied in the systems of interacting territorial complexes of various types, character and scales (sizes). The opportunities of the socialist countries with their

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planned economy and public ownership of the means of production and natural resources place a still greater responsibility on the geographers of these countries for the work performed.

The horizon of geographical research and its time and space ranges have been immeasurably broadened thanks to man's breakthrough into space and the beginning of systematic studies of the Earth from spaceships. The vast amount of spatial information thus acquired (which can automatically be put down on the map) differs qualitatively in many aspects from the information we formerly possessed. This new information gives a better and more correct idea of the complex character of the combination of various phenomena on the Earth's surface, of its spatial systems and their territorial structure and dynamics. But this, in turn, immeasurably increases the demands made of geography as a fundamental science that investigates large spatial dynamic systems. It must be able not only to decipher the complicated combinations of processes of the development of the given systems and their structures, but also to forecast, on this basis, their subsequent dynamics.[1]

These and other closely related circumstances dictate the need to sharply raise the level of geographical research. One of the most important prerequisites for achieving this is the development of theoretical sections and principles of geography. Geographers are showing a growing interest in theory. This is prompted, in part, by the introduction of modern methods of research provided by cybernetics, the theory of information, systems analysis and other new trends in the development of science which are becoming ever more widespread in geography and which serve as an additional stimulus for the theoretical understanding of the new situations that arise.[2] Particular importance attaches to the development of one of the most backward fields of geographical theory — the disclosure and analysis of the most general problems, concepts and regularities in geography that cover the whole system of geography as a science.

Theoretical geography is an important trend of research in this field. It is a new branch of learning that is part of the single system of the geographical sciences. We are witnessing the formation of this discipline, the purpose of which is, in particular, to establish spatial laws that bind individual and particular fields of geography into a single, integral system.

THE SUBJECT OF THEORETICAL GEOGRAPHY

Theoretical geography owes its progress to the new problems engendered by the STR, to the need for automated processing of a vast amount of geographical information, the investigation of complicated geosystems and their multidimensional spaces, to the new concepts of the space-time correlations in these systems, the imminent problems concerned with the elaboration of geographical axiomatics, and the need for revising many of the general concepts in geography. In this respect we believe that theoretical geography

cannot be equated with the theory of geography. The theory of geography is broader than theoretical geography. In addition to general geographical concepts and regularities, the former also encompasses the narrower and special concepts and regularities of particular geographical sciences. Theoretical geography, being more narrow in content, must possess a greater degree of integrity. Naturally, the development of theoretical geography is inseparably linked with the expansion and deepening of the theory of geography as a whole. At the same time, the development of theoretical geography is a major contribution to the general theory of the system of the geographical sciences.

Soviet scientists who recognise theoretical geography as an independent branch of learning are not unanimous concerning the range of problems it covers. Thus some distinguish theoretical geography in its broad and narrow senses. A. Kolotiyevsky, for instance, says: "In the broad sense, theoretical geography is the general theory of the systems of the geographical sciences, the sum total of the most general theories and hypotheses, but in the narrow sense, it is the general theory of geographic spatial systems (geochorosystems)."[3] Alongside with the general theory of geochorosystems (in which he makes a distinction between the theory of geographic regionalism — georegionics — and the theory of geographic structuralism — geostructuralistics), Kolotiyevsky includes in the content of theoretical geography such branches as the theory of spatial differentiation and organisation of human society's interaction with nature, the theory of geographic forecasting and the theory of geochorosystem management (geocybernetics). He also distinguishes on the theoretical level, but this time outside the general theory of geography (i. e., theoretical geography, as he understands it), the philosophy of geography and the methodology of geography.

Yu. Saushkin considers theoretical geography to be a calculus of the structure of spatial (territorial) systems and networks.[4] This is close to A. Kolotiyevsky's understanding of theoretical geography in the narrow sense. A. Smirnov distinguishes between theoretical geography and metageography. Theoretical geography, he says, generalises the results of all geographical sciences, reveals the objective laws common to all these sciences, and formulates the basic theoretical propositions of geography as a whole. Metageography, on the other hand, determines what is geography, what it is doing, its place among other sciences, its basic concepts, and the axiomatics of geography.[5]

We believe that at the initial stage of their development it is premature to draw a precise boundary line between the disciplines in question, to argue about how best to call them, or to dispute (or uphold) the validity of such branches as metageography, for example. What is far more important in our opinion, is that these Soviet scholars hold approximately the same views regarding the general character of the content of the respective sections of geographical theory. This determines a more or less similar approach to defining the basic tasks of their research. Ideologically, the development of

theoretical geography in the USSR, where it is closely linked with the practical requirements of socialist society, is based on the Marxist-Leninist methodology of science.

THE TASKS OF THEORETICAL GEOGRAPHY IN THE SYSTEM OF THE GEOGRAPHICAL SCIENCES

To clarify the place of theoretical geography in the system of the sciences and the tasks confronting it we suggest considering the following factors. Modern science has been advancing most vigorously at two poles: the megaworld which is being investigated by astronomy, astrophysics, and space research; and the microworld investigated by nuclear physics, chemistry and molecular biology. It seems that the vast world of medium-size objects, more or less comparable with man's own dimensions, attracts much less attention. This world encompasses also objects that constitute the research campus of geography. Our knowledge of this world, however, is often incomplete or fragmentary. For instance, we have no general picture of its spatial structure at the geographical level because its investigation is divided among many sciences, natural as well as social. Reference is, of course, to the repeating spatial structures that are embodied in natural and artificial bodies and groups of different dimensions and different material substance. In this respect, theoretical geography can make a substantial contribution.[6]

As is generally known, two tendencies — differentiation and integration — are interacting in the single process of the advance of science. At the early stages of the formation of science, when the productive forces stood at a low level, philosophy and particular scientific knowledge were fused into one in their prime integrity. This was predetermined by the low degree of the differentiation of social practice and weak specialisation of labour.[7] The ever quickening growth of the volume of scientific knowledge could not but necessitate the differentiation of the sciences. This process, natural and inevitable on the whole, has certain negative aspects. In particular, it hampers mutual understanding between scientists engaged even in related fields and leads to parallel or even similar research. Furthermore this process destroys the conception of the internal integrity of science. It could have brought about a general crisis in science if not the intensified integration and generalisation of knowledge of late.

The phenomena of the differentiation of science produce the greatest impact in conditions of capitalism, under which the unity of scientific knowledge has been broken while the processes of the synthesis of knowledge have been unable to occupy their proper place because of objective social circumstances. Meanwhile, the evolution of the productive forces and the transformation of science into a direct productive force has turned the integration of scientific knowledge from a tendency into a law of the present progress of

science. The private-ownership essence of capitalism, however, hampers a broader integration of the sciences.

The transition from capitalism to socialism removes the objective barriers in the way of integrational processes reflecting in an indirect form progressive social transformations. Developed socialism which combines the advantages of the most advanced social system and the achievements of the STR opens up special opportunities for these processes. One of the most important aspects of the integration of the sciences is the swift progress of metascientific approaches, the general methodology of scientific research and general scientific concepts and notions.

In the course of the integration and generalisation of knowledge a multitude of ideas gives birth to a new and broader concept, while a multitude of judgements gives birth to one generalised hypothesis or theory. This generalised knowledge does not negate a more specialised and specific knowledge, nor does it replace the latter. Usually it stands higher because of the higher hierarchic degree of generalisation that facilitates the movement from analytical to synthetic models, and vice versa. This is how the pyramid of scientific knowledge begins to rise.

In principle, the number of generalisation levels is not restricted. However, given a certain degree of conditionality, we can single out the main and more or less obvious levels. It is, first of all, the philosophical level upon which universal and logico-gnosiological categories are formed. Then, lower down, comes the general scientific level which includes the problems, methods and concepts common to all or many individual sciences at the current stage of their progress, excluding those that are related to philosophy. Any group of related or cooperating branches of science requires its own level of generalisation.

One of such levels for geography is represented by theoretical geography (and also, metageography) which is formed as a result of the generalisation of the achievements of individual geographical sciences (and, to a certain degree, related sciences that are investigating the environment on different planes). Theoretical geography as it were unbrackets part of the general ideas that have been accumulated in the course of the progress of the sciences of Earth and society. This circumstance, however, does not negate the independent existence of particular geographical disciplines or the possibility (and importance) of their development in the framework of their own theoretical sections (e.g., theoretical geomorphology or theoretical geography of towns). On the contrary, the progress of theoretical geography promotes the exchange of ideas between particular disciplines and the mutual enrichment of their theoretical and methodological sections.

Sometimes geographical generalisations, typical of theoretical geography, invite two kinds of objections. The first boils down, in the final analysis, to the assertion that similar concepts allegedly confuse the objective laws governing the evolution of nature and society, and that the laws governing the evolution of society are being replaced by

or reduced to those governing the evolution of nature. It seems to us that such accusations are founded on pure misunderstanding. No one, for instance, declares that mathematics is guilty of confusing social and natural laws just because one and the same mathematical concept is used in characterising phenomena of entirely different orders, whether social or natural.

As we see it, far greater importance in principle should be attached to the fact that in geography, primarily in theoretical geography, we are dealing with one of the particular expressions of the unity of the universe, and the objective connections between social and natural phenomena that make up the essence of the unity of all sciences, natural and social.

Karl Marx and Frederick Engels, as we know, did much to reveal the internal unity of the natural and social sciences and of their various branches. They proved that the nature of human labour leads inevitably to a close link between the natural and social sciences. This connection is effected through the instruments of labour, while its direct expression is found in the technical sciences which occupy an intermediate position. According to Engels, the laws of nature and society, the laws of our environment and the laws of man's corporeal and spiritual being constitute in essence "two classes of laws which we can separate from each other at most only in thought but not in reality".[8]

Lenin has creatively developed these ideas and proved that all arguments to the effect that the sphere of social phenomena is radically opposed to the sphere of natural-historical phenomena were basically unsound. He has revealed the essence of the proposition, formulated by Marx, that the economic law of the movement of society is the law of nature; he has substantiated the proposition that the socio-economic formation is a natural-historical process. Lenin stressed that "only the reduction of social relations to production relations and of the latter to the level of the productive forces, provided a firm basis for the conception that the development of formations of society is a process of natural history. And it goes without saying that without such a view there can be no social science".[9]

In the conditions of capitalism, social antagonisms give rise to a conflict between the natural and socio-humanitarian knowledge and way of thinking. This tells on geography, too, which is often regarded there as a purely social science with no natural aspect, while at other times and places its social aspect (usually, the leading one) is simply ignored.

When Marx said that "eventually natural science will incorporate the science of man to the same degree as the science of man will incorporate natural science—they will constitute an integral science",[10] he naturally implied that it would happen only in conditions of developed socialism and communism. In the USSR this process is already gaining in momentum. The unity of social, natural and technical knowledge that is forming engenders new processes of integration in science which are particularly clearly evident in

geography which has become a kind of proving ground for the mutual fertilisation of the social and natural sciences. In particular, this finds expression in the development of theoretical geography, and also of metageography.

From the standpoint of theoretical geography we believe, for instance, that there are all grounds for speaking about territorial zonality in general without in any way detracting from the independent significance of the existing models of physico-geographical and economico-geographical zonal systems connected with the various forms of motion. We regard this zonality as nothing but the spatial form of the manifestation of the dialectical law of the transition of quantity into quality.

Some are of the opinion that the concept of territorial zonality, just as other equivalent concepts of theoretical geography, adds nothing to the philosophic and general scientific level of cognisance, i.e., that the intermediate level of generalisation between the general scientific level, on the one hand, and the level peculiar to particular geographical disciplines, on the other, is unnecessary.

Despite all their significance, the general scientific and philosophical levels of generalisation, however, cannot tell us anything, for example, about the character of the differentiation of the land surface into qualitatively distinguishable zones or how a variegated pattern of spatial differentiation of the environment takes shape from the intersection and superposition of these zones. This is done by geographical chorology — a component, as we have already said, of theoretical geography.

At the same time, the theoretico-geographical conception of territorial zonality is not overlapped by the problems of phytoclimatology that serve as the foundation of the theory of natural landscape zones, or by questions concerning the geographical division of labour, price formation and differential rent, to which we resort in explaining socio-economic territorial zonality. What is essentially important for theoretical geography is the very possibility of zoning, the fact that the most varied in their nature spot and linear objects of geoenvironment equally lead to its division into zones.[11] We believe that such generalisations, often in point of fact of a metascientific (metageographical, in the case of geography) character, are also important because they promote the exchange of ideas between particular branches of learning and the general methodology of science, contributing thus to the single process of cognition of the surrounding world.

Another function of theoretical geography as a kind of integrating link in the system of geographical sciences is that although it introduces a number of new (general) concepts into this system, it must nevertheless markedly reduce the total number of concepts (the more specific ones) and regularities, knowledge of which is essential for a better understanding of the geoenvironment. The building of bridges between geography and related sciences, including sociology, economy and physics (through the medium of metageography) will enhance the generalisation of the basic concepts of geography as a

whole. Without this the further progress of our science is hardly possible.

We have used chorological examples to examine the generalising role of theoretical geography in respect to other geographical sciences. This, however, does not imply that theoretical geography can be identified with geographical chorology. Spatial dimensions and territoriality as fundamental properties of the objects of geoenvironment are no more important than the subject essence of integral geosystems. Of geography as a whole it can be said that it is territorial (spatial) in form and integral in content. Both criteria are of equal status and it is only their combination that produces geography. The most general task of theoretical geography is, therefore, the modelling of integral natural and social geosystems possessing a spatial structure.

Sometimes objections are raised against the independent existence of theoretical geography (and metageography) on the grounds that there is really no need to distinguish between theoretical and non-theoretical sciences since theory is the obligatory element of any science. This is true in a sense. However, we must not forget that the largest of the synthetic sections of geography — regional studies (and, in a more general sense, the whole regional geography) — is mostly an idiographic science which studies the unique and individual reality. The main, continually needed and the most popular output of regional studies (and possibly of all geography) is the scientific description of the Earth and its regions, big and small, in which the data of various particular geographical (and sometimes, not only geographical) sciences are being synthesised.

This task will never lose its urgency since the geosphere itself and the way it is being exploited by man are swiftly changing. People need, to use the expression of B. Rodoman, a kind of a technical passport for the geosphere, a passport that is continually renewed and made more precise. The principal task of geographical description in the STR era is the compilation of such passports. Unlike chemistry or biology, to say nothing of physics, geography today, too, studies mostly individual and unique objects, usually possessing proper names (e.g., Europe, New York, the Neva). True, the study and description of these objects rely to an increasing degree on scientific methods worked out by the systematic branches of the geographical sciences in their aggregate, various objective laws and generalisations, however, still act as a kind of invisible conductor. If this role is to be more effective it is necessary to stimulate the nomothetic branches of geography, a special place among which belongs to theoretical geography.

SOCIOLOGISATION OF MODERN GEOGRAPHY

The STR has changed the correlation between the various branches of geography. This is primarily reflected in the tendency towards sociologisation and humanisation inherent in the entire system of the geographical sciences, physical geography included. In the latter, the

resource approach to the subject under study is gaining predominance. Alongside purely economic factors, geographers are giving more and more attention to social factors, which brings them to a reappraisal of the subject of economic geography. Some researchers now speak of economic geography in the narrow and broad sense of the term, others refer to the expansion of socio-economic parallel with economic geography which includes both economic and social geography. The comprehension of these processes calls for a further broadening of the theoretical base of the system of geographical sciences.

With the unfolding of the STR the various aspects of human activity and social life are becoming increasingly interconnected and interdependent. The relative significance of the non-productive aspects of social life is sharply increasing. The volume and variety of material and cultural benefits are increasing, and this inevitably affects the behaviour of people. In this connection the significance of allround control and registration of this behaviour also grows, for even in developed socialist society the personal interests of people do not automatically accord with society's interests. The control of such complicated formations as the natural-social territorial systems requires that geography should employ approaches based on the registration and investigation of the behaviour of central element in these systems — man as a social being.

As we come to comprehend the fundamental inseverability of the various aspects of human activities, and also the connections between these activities and the environment in which they take place, geography, like many other sciences, re-examines its attitude towards the object of study and broadens it appreciably. Geographers show particular interest in making a study of the connecting links in the social man-environment system. This is reflected in the spreading ecological approach (in the broad sense) in geography. People in this case are considered as the central element of the anthropoecological model, as the main criterion determining the approach to all other elements. But then in addition to the cause-and-effect relations objectively existing between spatial systems of nature, technosphere and society, we must also know the reaction of people to these relations and to the components of the environment.

The increasingly complicated relationship between man and the environment has required the inclusion in the explanatory apparatus of science as a whole, and of geography in particular, of categories and concepts that characterise the relations inside the object under study and also subject-object relations. The conceptual framework of conventional, traditional science was made up of physical categories and concepts. Modern science, on the contrary, has a tendency to operate more and more with concepts and categories that reflect various types of ties and relations.[12]

Such sociological and socio-psychological concepts as requirements, system of values, perception, behaviour and others that are

closely related to them, are being introduced into geography on a broader basis, thus determining the formation of new aspects and trends in geographical research and linking them ever more closely with the social sciences.

Since the environment is undergoing radical changes, the question of the benefits which man derives from it is seen in a new light. The STR has accelerated the process of the transformation of the natural environment and the formation on its basis of a complicated urbanised environment that is becoming the sphere of vital activity of an increasing number of people and in the most developed countries of the bulk of the population. The problems, including social problems (sometimes exceptionally acute ones), that are connected with the qualitative remodelling of the environment put new tasks before science. They act as a powerful stimulus for developing geographical theory, enhancing its social aspect and expanding its links with other sciences.

Countries with different social systems feel the need to make a study of a broad range of problems connected with man's perception of the environment and his behaviour in it. The planning of territorial systems, and forecasting of their evolution, location of production and service enterprises, selection of recreation zones and many other urgent practical tasks are dependent on an in-depth study of the socio-psychological aspects of man's life and activity. Consequently, practical needs in combination with the very logic of the evolution of geography imperatively call for sociological methods in geographical research including broad application of the behavioural criterion.

However, the character, direction and the framework for such an approach are widely different in countries with different social systems. In bourgeois society, when capitalists are selecting the sites for their enterprises or organising the latter, they are compelled to take into account the socio-psychological factor and the character of people's behaviour, but in principle they are not interested in the final social result of their operations. The socio-psychological factor in the location model of capitalist enterprises is present so to speak only at the input and wholly ignored at the output. In the conditions of socialism, the social aspect, consideration of the human factor acts not only as a requisite condition for controlling the development of the social territorial systems, but also as its object.

The emergence and evolution of the behavioural criterion in geography is a manifestation of the sociologisation of the systems of the geographical sciences we have mentioned earlier. New trends of research, e.g., sociogeography and geosociology, with various combinations of elements and approaches to the parent sciences, branch off at the juncture of sociology and geography. Their progress can become a great contribution not only to geography and sociology, but to science as a whole.

Theoretical geography owes its evolution to a great extent to the progress of the general theory of systems and systems-structural analysis and also to the application of a whole arsenal of mathematical methods and means. Theoretical geography, however, does not narrow down to mathematical geography, it is much broader, fuller and versatile.

The present stage of development of the system of geographical sciences is characterised by a broader application of mathematical methods, and mathematical language, particularly for the formulation of geographic generalisations and laws, for geographic modelling. As a result, the language of mathematics has become an important language of theoretical geography. It is generally acknowledged that it is impossible to investigate the complicated spatial systems of geosphere without resorting to mathematics; without mathematics geography ceases to be a fundamental science that is called upon to make a significant contribution to the solution of a whole series of important problems posed by the STR.

We must also bear in mind that the use of mathematical language, concepts and methods without deeply understanding the nature of phenomena can lead only to a superficial knowledge. This predetermines the importance of the elaboration of a system of basic geographical concepts in the framework of theoretical geography as an essential basis for subsequent formalisation. This formalisation does not necessarily entail employment of the mathematical apparatus; it can be of a tectological character.[13]

The first steps in the elaboration of general geographical concepts have already been taken, but the main part of the work is yet to be done.

The most fundamental of the general geographical concepts are probably the concepts of geosystems and geographic space (geospace). Lately researchers in the USSR have been devoting much time to their analysis. However, there is still no generally recognised definition of the geosystem that would meet the requirements of the Marxist-Leninist methodology. To some extent the same is true of geospace (the concrete space of geosystems, as it is sometimes called), though there are signs of a general understanding of it as a type of multidimensional group space,[14] which includes as subsystems four-dimensional time-space and signs-phase space. In terms of metageography it would be very important to determine the correlation between geographical, physical spaces and map spaces, and also between geographical space and other group spaces, primarily economic and social.

The poorly developed conceptual framework leaves its imprint on all aspects of theoretical geography (and geography as a whole), it is one of the main reasons why the concrete methods of systems analysis have on the whole made little impact on the essence of geographical research, in spite of the outward popularity and wide use of systems terminology in the latest geographical works. It is only by radically

improving its theoretical basis (which apparently is impossible unless particular attention is paid to the development of theoretical geography and metageography and unless stronger ties are established with the related sciences, social and natural) that geography will receive the opportunity to utilise fruitfully the basic ideas of systems orientation and the formalisations developed by the general theory of systems or, broadly speaking, the basic principles of tectology.

Another group of difficulties that geography runs into in its attempts to construe mathematical models of such complicated objects as the geosystems is connected with the inadequacy of the mathematical apparatus employed in respect to a number of geographical problems. We must not forget that most of the sections of mathematics were elaborated to serve the needs of physics and engineering, and that they do not always correspond to the requirements of the sciences that investigate complicated systems. This calls for the continual quest for more appropriate methods among already existing ones or those that are still being elaborated. In this respect application of the apparatus of intransitive mathematics, fuzzy sets, etc., can be of particular significance. There is a sharp need for the elaboration of new sections of mathematics that would correspond more closely to the specific requirements of the social sciences and of geography. But this can be done only provided a special request for this comes from the said sciences.

The language of mathematics possesses certain advantages, sometimes overwhelming ones, in abstracting a number, but by no means all, aspects of the real world. We therefore believe that formal mathematical modelling cannot fully replace substantial and cartographic modelling. For some aspects of reality mathematical modelling is probably unsuitable (or only roughly suitable), particularly at the present level of man's knowledge.

The greatest difficulties are involved in the attempts to develop mathematical models of the spatial aspect of geosystems (as distinct from their substantial aspect): location, dimensions, configuration, etc., and particularly their combinations which are of utmost importance in geography. Consequently, the language of cartography is in many cases more adequate than the mathematical formulas in modelling spatial structures and their dynamics. Hence the need to elaborate iteration systems of models that would naturally combine cartographic and mathematical models. Such systems are of particular significance for theoretical geography which deals with the general approaches to the modelling of the spatial aspects of geosystems and geographic differentiation, including standard models.

The results of the spontaneous evolution of nature in the environment are inseparably intertwined with the results of human activity. This is why we need a science that would unify both natural and artificial (anthropogenic) objects (or their different aspects) in general models. Modelling is connected with the abstraction from particulars, with the transition from the individual to the typical, from things concrete to things abstract. The level of abstraction can be different. In theoretical geography it is higher than

in particular geographical sciences. Theoretical geography is primarily concerned not with specific countries, regions and localities, but with their types; it makes models of the real world in the form of various spatial networks consisting of surfaces, lines and dots.

These theoretical geographical models are also of great practical significance. Some believe that the more details are taken into account, the more accurate and useful the model. Actually, however, when the model is overburdened with particulars, even if borrowed from reality, its essential points disappear, so to say, in the motley mosaic of geographical differentiation.

It should be noted that unlike classical physics, geography studies objects that are usually so complicated that a single phenomenon cannot be explained by a single model. Its explanation requires a multitude (system) of models, both independent and in the form of the consecutive stages of the modelling process.

As distinct from its *object*, the immediate *subject* of theoretical geography are *models*, i.e., a certain imaginary world, in which, however, we see many familiar things since the individual bricks that make up this world are taken from reality. In the final analysis, the object of theoretical geography is the geographical shell that is common to the whole system of the geographical sciences. The models of theoretical geography are effectual depending on the degree to which they reflect the links existing in the reality that is being modelled.

When we make a model of the surrounding world, we can represent it as a multitude of landmarks, surfaces, lines and dots. This, however, is the geometric level of modelling. The theoretico-geographical level begins only when all this gets a geographical interpretation. In this way the geometric drawing is turned into a map.

* * *

Like all other sciences, geography not only explains the surrounding world, but also helps to transform it in man's interests. The dialectical evolution of modern geography proceeds from the description of individual reality to abstract models, and from such models to forecasting, designing and reconstructing the environment. The theoretico-geographical comprehension of the environment, as we see it, is a natural stage in its cognition. In passing from the models that merely state facts to the project-models, theoretical geography merges with the general stream of constructive geography.

The ultimate task of theoretical geography, in our view, is to develop, out of separate and more or less particular models, a global theoretical conception of the evolution of the geosphere and its state at different stages—a kind of an alloy of forecasts and projects with due account of the feedback connection, i.e., their influence on the future behaviour of people. The fundamental concepts of our society concerning the meaning of mankind's existence, the criteria of the usefulness and the purpose of social production, and the paths of social progress must be adequately reflected and refracted in the projected patterns of the spatial structure of our world.[15]

The logical and historical path of the evolution of geography stretches from descriptive landscaping to the construction of cultivated landscapes, and from the simple description of geographical locations to its purposeful formation. We firmly believe that the elaboration of the principles of theoretical geography is an important stage in the advance along this path.

NOTES

[1] See V. Gokhman, Yu. Saushkin, "Current Problems of Theoretical Geography", *Voprosy geografii*, Moscow, 1971, No. 88.

[2] See V. Sochava, "Problems of Contemporary Theoretical Geography". An afterword to D. Harvey's *Scientific Explanation in Geography*, Moscow, 1974 (in Russian).

[3] See *Theoretical Geography. Materials of the Symposium on Theoretical Problems of Geography*, Riga, 1973, p. 9 (in Russian).

[4] See ibid., p. 18.

[5] See A. Smirnov, "General Geographical Concepts", *Voprosy geografii*, 1971, No. 88, pp. 29-30.

[6] See V. Gokhman, B. Rodoman, "Some Trends in the Development of Theoretical Geography in the USSR", *Voprosy geografii*, 1975, No. 100.

[7] See V. Gott, A. Ursul, *General Scientific Concepts and Their Role in Cognition*, Moscow, 1975 (in Russian).

[8] F. Engels, *Anti-Dühring*, Moscow, 1969, p. 137.

[9] V. I. Lenin, *Collected Works*, Moscow, Vol. 1, pp. 140-141.

[10] K. Marx, F. Engels, *From Early Works*, Moscow, 1956, p. 597 (in Russian).

[11] See B. Rodoman, "Zonality and Geographical Zones", *Vestnik MGU, seria geografiya*, 1968, No. 5.

[12] See, for example, I. Blauberg, E. Yudin, *Evolution and Essence of Systems Analysis*, Moscow, 1973 (in Russian).

[13] See A. Takhtadjyan, "Tectology: History and Problems", *Systems Research. Yearbook 1971*, Moscow, 1972 (in Russian).

[14] See A. Aslanikashvili, *Metacartography. Basic Problems*, Tbilisi, 1974; A. Smirnov "General Geographical Concepts", *Voprosy geografii*, 1971, No. 88; V. Gokhman, A. Mints, V. Preobrazhensky, "Systems Approach in Geography", *Voprosy geografii*, 1971, No. 88; Yu. Saushkin, *Economic Geography: History, Theory, Methods and Practice*, Moscow, 1973 (all in Russian).

[15] The basic ideas in this field belong to B. Rodoman.

Ecological Problems Highlighted by Urban Environment Modelling

YURI MEDVEDKOV

The modern world is characterised by a rapid rate of urban growth. The public and experts have noted first some individual indications of this growth—those aspects of the process in which it proceeded in acute form and demanded immediate decisions (urban expansion at the expense of farm land, steps to provide the expanded cities with sophisticated communal services, concern over the flow of people from rural localities, the continuous reconstruction of cities, the need for large-scale housing construction, and so on).

For some time these urgent but, nevertheless, specific problems overshadowed the ecological content of the process of urbanisation, which influences the life of all urban dwellers and ultimately all mankind. The urban environment is becoming the habitat of man, where the bulk of mankind is moulding a new way of life.

Having concentrated an unprecedented percentage of all the productive forces, the modern city influences the environment in three main directions.

First, in themselves cities have become the environment of many millions of people. The urban environment is growing like an avalanche and the most general tendency is that the larger the town the more people it attracts. It has been estimated that within the next 30 years more buildings will be erected in all the cities of the world than were built during all the preceding phases of man's history.

Second, the town has become a centre actively influencing the surrounding area. The organisation of suburban agriculture, recreation zones for town dwellers, and the need for water supply and waste

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disposal are examples of the urban metabolism changing the appearance of the land within a radius of many tens of kilometres. The conditions of life are changing just as intensively under the influence of daily commuting trips necessitated by labour and by cultural and everyday links. The radius of a city's influence over the surrounding land has grown sharply during the past 50-100 years as a result of the use of modern mechanical means of transport.

Third, the entire urban network has begun to exercise an appreciable influence on the natural processes of our planet. A qualitative change is taking place in this area with the growth of urban networks into agglomerations. The changes in the geometrical forms of cities, i.e., the switch from point networks to surface-filling development, increases the length of the zone of contact between the technogenous environment of the urban and the rural environment, where natural processes prevail. The countryside intersected by cities and intensive inter-urban communication corridors, is assuming a patchwork character. Cities are "temperature islands" heating the paraterrestrial layer of the atmosphere. They are an abundant source of pollution. A specific city climate is taking shape. Similarly, radical changes are taking place under the influence of towns in the vegetation cover and in the soil (where urban waste accumulates), in the conditions of surface runoff, in the chemistry of reservoirs, and in the remnants of fauna.

Each of the influences exercised by the city on the conditions of human life may be given a name in order to accentuate the specifics of the process. These are processes: 1) constructing a qualitatively new habitation environment; 2) modifying the natural landscape through the spread of the technogenous zone; 3) bringing about an overall background change of the biosphere. Available data[1] indicate that the first process, which takes place directly in cities, merits the closest attention. On the one hand, we deal with the conditions of life for the bulk of the population and, on the other, with the source giving rise to the influence of the second and third processes. It must be remembered that today 56 per cent of the population of the USSR and nearly 40 per cent of the population of the world live in cities. It is expected that by 1980 these figures will have grown to at least 68 and 46 per cent respectively.

It is our view that the urban environment has three specifics that are essential to the choice of scientific methods and approaches.

The urban environment of habitation is a system formed by heterogenous components. There are components of a physical nature, for instance, climate, hydrography and relief; of a biotical nature, for instance, vegetation; technogenous, such as the transport network of cities; and social, such as the social organisation of the population.

The urban environment is organised and develops in accordance with the laws of a complex system; its behaviour is "counterintuitive".[2] The following description, which has become widespread in the general theory of systems, may be applied fully to a city: "A complex system is a set of interacting elements forming an indivisible

whole, in which it is impossible to trace the cause-and-effect links determining the behaviour of each subset of elements."[3]

Social practice has singled out a key component—population, relative to which the development of the entire urban environment is analysed. In other words, this concerns not an autonomous system generally but of the "habitat-its user" construction, where the user is the population formed by and, in its turn, forming the city. This construction signifies that it is necessary to turn to human ecology, also called anthropoecology.

In the given context, the term "ecological approach" is used to designate the formal specifics of one very large group of models. This group is characterised by the "environment-its user" construction and accentuates the lines of links running from the components of the environment to the "user" (and vice versa). But the term does not involve the obligation to chose definite laws to show the details of the mechanism of links. There is, in particular, no need to rely absolutely and above all on biological laws. The question of showing the details of the ecological model must be settled in a special way—on the basis of additional considerations about the possibility of other approaches with which the ecological construction can be combined.

The wide use of the ecological construction in biology by no means excludes its use in other sciences—to reflect their own laws. Take, for example, the very wide use of maps in the most diverse sciences. Following the initial use of maps in geography, they began to be compiled successfully in botany, geology, history, military science, medicine, etc. A common formal feature of models in this case is the "space organisation-orientation-scale" construction.

The use of the ecological model of the "habitat-its user" type permits adopting a new approach to the role played by cities in changing man's environment. What was considered earlier in the shape of processes 1,2 and 3 may be studied with the aid of three different variants of the above-mentioned model. A variant of the "*urban dwellers ecology*" model corresponds to Process 1. Here the habitat is the townscape, and the town dwellers are the "user". The "*urban islands ecology*" model is adequate to Process 2. This signifies that without any special detailing, the entire town plays the role of "user" of the ecosystem, where the habitat is represented by the zone of land that is external relative to the town and by the inflow of materials, energy, information and people. The "*urban network ecology*" model corresponds to Process 3. In this case, cities come out as an integral central link of the ecosystem, as nodal points influencing the earth's natural envelope, which comes forward as the habitat.

When comparing these three variants of the ecological model, it may be noted that the question of the advantages of the development of the system for the "user" depends ultimately on the influences exercised on local residents, on the entire urban population, or on the mankind. In this respect the "urban dwellers ecology" variant can furnish albeit not exhaustively) the largest number of answers.

COMBINING THE ECOLOGICAL APPROACH WITH GEOGRAPHICAL MODELLING OF ENVIRONMENTAL CONDITIONS

The interaction between the population and the environment is one of the cardinal and traditional subjects in geography. Some of its schools accord first place to this subject (Vidal de la Blache, Max Sorre). It has been proposed that as a whole geography should be identified with the ecology of man (H. H. Barrows).

The ecological construction ("habitat-its user") has been developed in geography in two of its basic variants:

a) *unilateral influence*, under which the environment is regarded as a spectrum of factors influencing people;

b) *bilateral influence*, under which the active reshaping of the environment by man is regarded as a response to a set of stimuli directed from the environment to the population.

The second variant evidently mirrors reality most fully. It is traditionally elaborated within the framework of *géographie humaine*, a scientific school that sprang up in France early in the 20th century. In Soviet geography this sort of ecological construction is broadly represented in works on population geography, the geography of cities and settlement.

Needless to say, solely tradition, the habit of working with an ecological construction is far from enough to enable geography to undertake the solution of complex environmental problems in the world today. In itself this construction may help to emasculate the substance of the problems (this is to be observed, for instance, in the epigonic works of proponents of *géographie humaine*).

Fortunately, modern geography has a sufficiently large arsenal of methods that create the prerequisites for developing the ecological construction quickly and with the involvement of a wider range of problems than can be suggested by many other disciplines. These prerequisites emerged as a result of the development of geographical theory and methods: a) in constructive supplements linked with the participation of geographers in economic planning, in works on regional and urban planning; b) in the course of the so-called quantitative revolution which transformed geography in the 1960s. The role of this revolution merits special emphasis. Among its fruits mention must be made of three fundamentally new achievements in geography that are making it possible to delve deep into the substance of present-day ecological problems.

First, geographers have mastered mathematical model building skills and begun the modelling of complex geosystems. Second, geographers have become experts in the computer application for automated mapping of areal data and this has provided greater possibilities for embracing and processing information on geosystems than in the period before the quantitative revolution. Third, geography has received and included in its orbit remote sensing, a new source of mass information on geosystems.

In order to appreciate fully geography's potentials for developing the ecological construction, it is necessary to take into account not only latest methods but also the vast body of ideas underlying geographical modelling of the environment.

Knowledge about the spatial integration of phenomena enables geographers to close the gap between the heterogeneous systems of the environment (natural, technical, social). The interests of many sciences do not range beyond one of these subsystems; with rare exceptions, geographers recognise the need for "building bridges" between the components of the spatial complex.

Knowledge about spatial organisation gives geographers extensive information about environmental systems. In addition to the number of components in a system, the direction and intensity of the links are in the field of vision as well as the arrangement of components in respect to each other and in relation to the points of the compass.

Knowledge about space as a field of potential interactions among geographical masses opens the road to a qualitative assessment of the benefits of location for urban environment sites (with account of the diversity of benefits, the sources of risk, the size of the activity spaces, the day-to-day mobility and time-budget of the population).

Knowledge about synergism in interaction of spatial patterns permits added realism in attempts with environment optimisation: local and global optimums as well as time-lag masked optimums compete to each other so that one hardly finds an optimally organised geosystem without a strong component of "noise" features. Geographers have a good idea of the size of the remnants of organisation inherited from the past, the hierarchal character of geosystems and the inevitable kaleidoscope of formations that emerges at the intersection of the hierarchies of various systems on a single territory.

Alongside two new achievements of the quantitative revolution (computer cartography and remote sensing), practice of thematical mapping and that of regional descriptions have created the basis for the exhaustive parametrisation of the environment. Geography has drawn into its sphere of study such a large number of environmental parameters that they are sufficient for any conceivable model in which an ecological construction can be realised.

Knowledge about the links between processes and forms (structures) arising in the course of these processes makes it possible to highlight unobservable processes by considering spatial forms indicative to the processes. There is a certain experience in handling latent mechanisms in this way.

The experience built up in the mathematical modelling of the environment (particularly the urban environment) has made it possible to concentrate on the most promising approaches to integral modelling of this environment. Indicative in this respect is geographers' interest in Forrester's system dynamics (a number of theses in the USA in which "urban dynamics" is analysed, the dispute over Meadows' planetary model by geographers in Britain).[4]

By and large, geography has a big contingent of researchers and substantial experience in turning the ecological construction into working models.

THE PREVALENCE OF THE ECOLOGICAL CONSTRUCTION IN URBAN MODELLING IN GEOGRAPHY

The advance of the frontiers of knowledge in geography may be portrayed as the filling of "blank spots" on the map. Whereas initially these spots were uninhabited territories, today they are more frequently becoming areas with the most dynamic development, where the renewal of maps hardly keeps up with the innovations appearing as a result of human activity. In this respect first place belongs to cities.

The elaboration of geographical models of cities is one of the most pressing and, at the same time, most difficult areas of study. Activity in this area is developing at a mounting rate. A summary of the experience of geographical modelling of the urban environment, published in 1970 by Berry and Horton, filled a book of 564 pages.[5] Today models of cities are produced in mass lots just as factory output.

In view of the abundance of experiments in modelling the urban environment, their systematics is needed so as not to lose one's bearings in this mass output. In geography, proposals have been made on a systematics of models based on the methods used in modelling. This approach was applied by Chorley, who distinguished three main branches of models: mathematical, simulation and scale.[6] Regretfully, no further taxonomical levels of systematics were suggested by him. It seems that they would have led to an "open" systematics, in which new groups of models would always spring up when new methods were mastered. There is some doubt, however, that it was possible to evolve an exhaustive ("closed") systematics in using methods as the basis of classification.

Neither has Haggett evolved an exhaustive classification.[7] As the basis for his classification he used the concepts arising at different levels of the generalisation of the geographical specific (movement, networks, nodes, hierarchies, surfaces). A clear-cut and convincing systematics emerges from the key concepts proposed by Haggett, but both methods and concepts are sequences unlimited from above and, consequently, cannot lead to an exhaustive classification of models.

The necessary consummation in the systematics of geographical models can be achieved if the structure of models is used as the basis of classification. In a systems-structural analysis use is made of a graph showing a network of oriented linkages among the many components of a system. This graph reflects a very essential aspect of the problem. The accent is placed on the arrangement and mutual-dependence of components, and this allows seeing in the phenomenon under study the features of organisation immanent in systems. If a graph shows the links between the different components of organisa-

tion, it is possible to picture, albeit partially, the work of the given organisation.[8]

There are strong reasons for regarding the large class of objects studied by geography as systems. The structure of a model represents the new element that a system has in comparison with a mere sum of its components. The structure of a model and the structure of the original system are linked by relations of similitude, of isomorphism. This allows us to understand the reasons why the portrayal of a model in the form of a graph makes it possible to give prominence to very important aspects of geographical systems.

Models used in geography may be divided into four groups in accordance with the structure of the linkages, used in modelling, between components of geosystems. If the skeleton of the linkages (ignoring the many shades in the strength of these linkages) is portrayed as a graph, the following definitions are applicable for the four groups:

A — tree with unilateral (oriented) links relative to the central component of the system;

B — tree with bilateral links relative to the node marked as the central element of the system;

C — graph without cycles that does not have the properties of a tree, but has one node that towers over all the others by seniority;

D — graph with cycles that does not have a predominating seniority node.

Since these are linkage graphs, their entire set may be subdivided into subsets A, B, C and D. Thus, the suggested systematics of models is exhaustively complete and consummate. The further detailisation of the above-mentioned groups is permitted in accordance with the approach to the assessment of linkage, the character of cycles and nodes accepted in the theory of graphs. It must be explained that model groups A, B and C conform to the ecological construction, and group D lies outside that construction.

The suggested systematics of models allowed making interesting observations. Papers published in *Geographical Analysis* (1972-1973) and *Economic Geography* (1971, No. 1) showed the following distribution of models by groups A, B, C and D (see Table).

Group of models	Models of cities	Models of other systems (applicable to cities as well)	Total
A	1	6	7
B	24	6	30
C	1	5	6
D	1	3	4
Total	27	20	47

The predominance of cities, noted earlier, in model-building experiments with geographical systems is eloquently borne out by this Table. More than half of all the models are based on the data of urban geosystems. As regards the ecological construction, its prevalence is even more striking. Of the 47 models 43 concerned the ecological construction, with one group (B) occupying a clearly predominant position, particularly in experiments in modelling urban systems (24 models out of 27).

Group A models are used in working out problems such as the appearance of a central places hierarchy in a region, elucidation of the axioms leading to the formation of a hierarchy of settlements, the division of the environment into spheres of influence of networks of centres or the sphere of influence of one centre (exerting different influences on the environment), and changes in human health under the impact of environmental factors.

Group B models are so numerous that it is necessary to use an additional systematics of central components. Earlier we noted that here the city dwellers, the city or a network of cities (population, dominating centre, network of centres — in working out the problem generally) are the "users" of the ecological construction. Correspondingly, we shall speak of three groups of problems: B (1) B (2) and B (3).

The problems in Group B (1) include an assessment of the linkages between the spatial structure of urban action space and group activity spaces, day-to-day movement of the population depending on the properties of the action space, the spatial stratification of the population depending on vital interests and the world outlook, the formation of the population density field and the accompanying development of centres of attraction in the city.

In Group B(2) we shall note the problem of the organisation of passenger traffic streams at points of contacts of urban dwellers with suburban centres of attraction and the general analysis of the city's linkages with the environment.

Group B (3) includes the problem of population migration to different types of cities, the question of the optimal allocation of service areas relative to differently sited centres, and the study of the parallel differentiation in centres and their hinterlands.

In reviewing the problems that geography is working on with the help of the ecological approach, the following must be noted: geographers work with enabling them to make a very general study of the ecological problems of cities, and consequently: a) there is interest in models allowing for their very broad application to applied problems; b) attention is centred not only on ascertaining the spatial organisation but also on the organisation of the population; c) there are problems of a pronounced research character; attention is attracted by the total absence of a selection of works on the enviromental pollution of cities, this being a good example of a subject that moves from the sphere of science to the sphere of instructions and operational administration.

On the whole, by their diversity and general orientation these problems show that models A, B and C are promising for a geographical study of the complex urban system. We see that the ecological approach was used in most of the selected studies and that it is organically connected with the modelling of geosystems.

THE DEVELOPMENT OF METHODS OF HUMAN ECOLOGY IN THE GEOGRAPHICAL STUDY OF CITIES

Our knowledge of the ways of resolving the ecological problems studied by geography would be incomplete if we were to limit ourselves to merely mentioning the use of modelling in that study. Mention must also be made of the specific methods thanks to which the experiments of geographers in ecological construction led to the appearance of a special scientific trend—human ecology.

In present-day works on human ecology, the object of study is the group and socially conditioned adaptation of the population to a complex of systems that make themselves felt in the form of a spatial integration of the conditions of life. Here two aspects are similarly important, namely, changes in a system under the influence of man's activities and changes in people's possibilities under the influence of the arrangement of space.

Human ecology takes part in resolving the problems raised by constructive geography. Its efforts are aimed ultimately at controlling geosystems and ascertaining optimal conditions in the dynamics of geosystems. There are several criteria of optimisation, i.e., various views of what must be regarded as good and evil in the dynamics of geosystems. This is precisely where the specificity of the target guidelines of human ecology begins.

The various branches of constructive geography differently assess the measure of success in controlling geosystems. Success is regarded from different points of view, in different aspects that supplement each other. There are at least three such viewpoints. It is suggested that the desirability of any change in geosystems should be evaluated in the light of: a) the preservation of the dynamic equilibrium in the natural complex so as not to destroy the capacity of natural systems for self-regulation; b) an increase in the volume of material production, including raw materials, power production and food; c) the preservation of people's ability to adapt themselves to changes.

Physical geography's contribution in this list is represented by proposal "a". Proposal "b" comes from economic geography, and proposal "c" from human ecology.

The criterion suggested by human ecology for the control of the environment removes the danger of extremes in the transformation of nature and in the construction of an artificial environment. It guarantees against the emergence of situations prejudicial to the

labour capacity and creative possibilities of people. As a trend in science, human ecology uses generalised knowledge of the organisation of the environment. The environment is identified with a system of stimuli that enlarge the choice of benefits perceived by and accessible to various groups of the population. It is believed that signs of the environment's deviations from the group optimum are taken for stimuli for an improvement of the environment. In this case there arises a steady feedback in the bi-unial "stimulus for action⇄transformation" circuit. The feedback is destroyed, in other words, signals act as stressors discouraging people, when the deviations from the optimum are too great.

Human ecology, which has a definite object of study and its own target guideline in questions related to environmental regulation, also displays certain preferences regarding the methods of study. The following four methods are used most frequently.

1) *Expert assessment of environmental quality.* In the USSR a considerable impetus was given to the development of this method for urban aud regional planning by V. Pokshishevsky's work on the convenience level of the conditions of life in towns in different natural zones.[9] An example of expert assessments of environmental quality in urban and rural localities is the book by E. Lopatina and O. Nazarevsky.[10]

2) *Factorial ecology techniques.* This method permits defining the parameters of the conditions of habitation by reducing a large number of observable indicators to some fundamental phenomena. This is usually achieved by the factor analysis. Lazarsfeld's latent structure analysis is also applied. A negative attitude to factorial ecology as a trend in science is expressed in a fundamental work on the theory and methods of economic geography.[11]However, in our view, this assessment concerns not the method, which is quite correct and justifiable in geography, but the use of the method in the works of some American scholars.

3) *Early warning by indicators of risk.* This is a further step in analysing by objective means the extent to which the environment influences people. This method is used when there are selective data on adaptation outlays with which the conditions in various "habitation" centres are compared. A regression and discriminant analysis is most frequently used to select the conditions obtaining in places with a high adaptation outlay. The environmental organisation in cities is usually such that there is a strong correlation between the set of conditions registered in the centres of town space. In this case use must be made of the method of regression analysis that can overcome the multicollinearity of variables issue. In the study of Hannover, the group of computer programmes worked out by the author made it possible to ascertain indicators of places with a high level of risk for the population. The success was exceedingly high while the predictors were to indicate places of risk in urban districts outside the sample used for selecting the predictors (80 per cent for places with a high level of street accidents).[12]

4) *The Deductive approach to modelling the mechanism of adaptation reconstructions.* An example of the application of this method is to be found in the works of I. Matlin, where simulation modelling is used for assessing the level of our knowledge of reasons inducing people to move from one place to another.[13] The most impressive foreign examples are: the model of the dynamics of a city created by Forrester in his study of the problems of Boston, Michael Batty's experiments in modelling systems of cities, and the model of the environmental quality of California created under the direction of K. Watt.

This method includes the elaboration of models that go beyond the framework of ecological construction (earlier we included them in Group D). The most adequate model for studying a complex system with ramified linkages is the construction suggested by Forrester and today identified with system dynamics. The group of models that we have considered earlier and which geographers use in realising an ecological construction may be regarded as the preparatory stage for the switch to system dynamics.

The modelling of the environmental quality of a city by system dynamics methods requires the creation of so-called scenarios reproducing the entire network of existing linkages between the components of the system. The behaviour of the model and its ability to reproduce the picture of a city's development depends on the analysis of components and linkages. A correct decision has to be found by a preliminary study of fragments of the system (i. e., by experiments with models of groups A, B and C) or by processing big data matrices relevant to urban places.

The readiness of system dynamics to suggest models that can authentically reproduce the future of such complex system as a city should not be overestimated. Considerable work is required to improve the methods of system dynamics and to master the use of these methods. An instructive conclusion was drawn by the working group on system dynamics which at its sitting in Paris in 1972 discussed the prospects for the studies suggested for the MAB (Man and Biosphere) Programme sponsored by UNESCO. The working group unanimously recommended the use of system dynamics models in all of this programme's research projects without exception. At the same time, it was noted that the absence of experience in practically all countries was the main obstacle to the application of the new and promising method. In this respect, geography's experience of applying models in resolving anthropo-ecological problems in the system of cities acquires especially great significance. We are referring to the prerequisites for major work that is at the pivot of scientific quest as a whole.

The anthropological approach in the geographical modelling of urban geosystems is now used on a growing scale. It may be expected that in the near future geography will be able to rely on the solid foundation of the anthropo-ecological theory of geosystems.

The anthropological principle of organising geosystems draws the attention of scholars to the recombination of cells of the biosphere into an arena of human life. Vast possibilities are opening up for optimising structures and constructing models that have shed light on the aims of the development of the arena of life.

NOTES

[1] See A. Kudryavtsev, *Rational Use of Territory in Planning and Building Cities in the USSR*, Moscow, 1971 (in Russian).

[2] See Jay W. Forrester. *Urban Dynamics*, Cambridge (Mass.), 1969, pp. 9, 10.

[3] D. Yudin, "Economic Cybernetics and Mathematical Economics", Afterword to Kelvin Lancaster, *Mathematical Economics*, Moscow, 1972 (in Russian).

[4] See *Futures: the Journal of Forecast and Planning*, Februarv. April, 1973.

[5] See Brian J. L. Berry, Frank Norton (ed.), *Geographic Perspectives on Urban Systems with Integrated Readings*, Englewood Cliffs, New Jersey, 1970.

[6] See R. J. Chorley, "Geography and Analogue Theory", *Annals of the Association of American Geographers*, 1964, Vol. 54, pp. 127-137.

[7] See Peter Haggett, *Locational Analysis in Human Geography*, London, 1965.

[8] See C. West Churchman, Russel L. Ackoff, E. Leonard Arnoff, *Introduction to Operations Research*, New York, 1957.

[9] See V. Pokshishevsky, "Principles of the Method of Assessing Habitation Conditions in Different Geographical Situations," *Izvestia AN SSSR, seriya geograficheskay*, 1964, No. 3.

[10] See E. Lopatina, O. Nazarevsky, *Assessment of the Environmental Conditions of Human Life*, Moscow, 1972 (in Russian).

[11] See Yu. Saushkin, *Economic Geography: History, Theory, Methods, Practice*, Moscow, 1973 (in Russian).

[12] Yu. Medvedkov, *Ecological Diagnoses of Street Accidents in Hannover and COMP Programme Development WHO/RECS Seminar Paper*, November 1971.

[13] See I. Matlin, "Statistical Modelling of the Development of a System of Settlement", *Voprosy geografii*, No. 88, Moscow, 1971.

The Geography of Population

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The current stage in the development of the system of the geographical sciences testifies to the ever greater importance of population geography in that system. It would be wrong to regard that discipline as something novel which has come to the fore only in the 20th century, or to link its inception either with the German school of anthropogeography or with the French school of *géographie humaine.* In effect, this discipline is as ancient as geography as a whole, a science which since antiquity has always dealt with countries and their populations—their inhabitants, their occupations, ethnic features, forms of settlement, and social systems.

How is one to account for the keen interest now being displayed by geographers in questions of population? Let us take those who engage in their discipline from the angle of the economy. The universal role of the labour principle, which involves human beings i.e., the population, has revealed itself most outstandingly in the era of the scientific and technological revolution. Ever greater significance in the life of society attaches to such functions as information, communications, management, services and other types of industrial activity, which are exerting an ever greater feedback on material production proper, which was for so long the "classical" object of study of economic geography. In a number of cases there has been a gradual decline in the significance, in this area, of raw materials, and in other material factors; at the same time, advances in the transportation of raw materials and energy transmission have, as it were, "dematerialised" space itself, thereby reducing the significance of distance.

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At the same time, a perceptible process of "demographisation" is taking place in the entire complex of socio-geographical sciences. The utilisation of mass statistics on population now underlies the introduction of mathematical quantitative methods. Also taking place is an overall "sociologisation of geography", the latter's attention now being focused on criteria linked with the social development of individuals, population groups, and all mankind.

On the other hand the complex of physico-geographical sciences is revealing growing interest in population. In the era of the scientific and technological revolution, anthropogenic (or, as some prefer to call them, technogenic) factors are ever more becoming powerful agents in transforming the environment. We now have good grounds to believe that man's industrial activities are affecting that environment with the force and intensity of geological processes.

The solution of ecological problems calls for fundamental forecasting of the size and structure of population, both in the world as a whole and in its various regions. The UN experts have predicted that in the year 2000 the world's population will be between 5,490 thousand million and 6,990 thousand million, a fourfold increase for the 20th century.[1] The most probable figure has been estimated at 6,500 thousand million. Although the prospect of further stabilisation of the Earth's population (presumably in the 22nd century) would seem probable, the range of problems to be studied by population geography within the next few decades will develop entirely against the background of an unprecedented population growth.

Thus there has already been a considerable increase in the responsibility devolving on geographers in the study of population problems. This, in its turn, calls for ever deeper cognition of the laws of population geography. The further course of the scientific and technological revolution may be expected to enhance the role of population geography in accomplishing the constructive tasks of social development.

In this area, can the achievements in the biology of man raise new problems for population geography? That is hardly the case. Some Western demographers[2] think, for instance, that the possibility of choosing the sex of a future baby will lead to a decline in the birth rate; that, however, could be significant only in countries where there has been a traditional preference for male offspring, a tradition that will probably grow much weaker in the future, since, in the final analysis, it is human nature to want both male and female offspring. Although the psychological dichotomy between the "sexual want" and the "reproduction instinct" is becoming a global process, to mankind as a whole (and the more so to the socialist world), children will remain an "absolute value", it is only in respect of some bourgeois countries of the West that one can agree with the bitter statement that the divorcement of sexual love—which, has become an end in itself—from the functions of continuing the race is the "price which man in these countries (i.e., bourgeois countries—*V. P.*) is prepared today to pay to avoid any belittling of his sense of his own value".[3]

There is reason to believe that the present trend towards a decline in population growth (as a consequence of lower birth-rates) will gradually spread in the developing countries. This will take place, first and foremost, under the influence of socio-economic factors, the qualitative transformation in the colonial structure of the economy, as well as a change in traditions and sense of values. Advances in the control of biological processes (including contraception) will prove merely a means of giving effect to the operation of such forces.

On the borderline between demographo-biological and socio-economic forecasts stand prospects of the greater "burden" of child groups (longer years of schooling) and especially old-age pension groups on gainfully employed groups of the population. Some Western authors have expressed concern over the prospect of each gainfully employed adult having to support two old-age pensioners in some future time. However, such anxiety is groundless since the able-bodied population's share of the entire population will grow together with the development of countries and regions. This is borne out by what is known as economic age-pyramids, which have been very well evolved, for instance, by the Hungarian demographical school. Besides, the growth of the productivity of social labour is outstripping changes in the age structure of the population of the world as a whole, and of individual regions.

On the other hand, many new features are promised by changes in the distribution and technology of industry and in processes of social development as a result of the scientific and technological revolution. Ecological demands alone are creating the need for the concentration of a number of industries (and therefore of the population engaged in such industries) without which there can be no control of injurious industrial pollution and, in the final analysis, any conversion of industry itself into complex production without waste. One can forecast the greater attraction of coastal areas to the population, this in view of the greater role played in the economy by submarine shelves, the greater prospects of building artificial land in shallow-water areas, advances in the desalinisation of sea water, the construction of tidal electric power stations, etc.

However, the link between settlement and the distribution of production, especially with its growing concentration, will grow weaker and more mediated. The decrease in the employment of human labour through advances in mechanisation and automation, the possibility of human labour being used in many cases for distant control of industrial processes, and a more advanced "transport environment" will lead to the social factor becoming ever more dominant over the industrial in the distribution of population.

The nature of population distribution, including the very pattern of such distribution, will however, continue to be ultimately conditioned (although in a modified way) by the spatial nature of industry (at focuses, in areas, or linearly). As for the natural and geographic environment, it will continue to exert a substantial influence on population distribution. On the one hand, the environment creates certain conditions for industry (the existence of various resources and

other preconditions); on the other hand, it creates a sum of conditions for human habitation, the building of settlements, water supply, and so on. Thus the geosphere influences concrete forms of population geography mainly through the medium of production — directly or indirectly (the severity or mildness of the climate, the convenience of construction sites and so on). The prospect of an accelerated human impact on the enviroment and the new possibilities of modelling the latter will call for a more detailed study of the extremal conditions of human habitation in an environment made fit by engineering advances in conditions initially hardly suited to maintain human life (desert areas, the Arctic, and so on). At the same time, however, the growing demands to the quality of life will also lead to a desire to make better use of territories that favour habitation. In all cases, population geography will have to collaborate here both with medical geography and with the rapidly developing geography of leisure pursuits and tourism.

What has been said regarding the determinative influence, on population distribution, of production as such, and of social conditions (the latter's influence being indirect yet stemming from the mode of production) calls for an examination of these interdependences on the *historical* plane. It should be remembered that, in the course of the historical development of the productive forces, the nature and the distribution of production undergo change: resources that did not previously present any value to society (or did not come to its notice) may acquire prime importance; others may prove exhausted; industrial processes may undergo change; the transport and geographical situation may become transformed, and so on and so forth.

Despite the ultimately determinative role of production, a population geography that has taken shape may and actually does exert a reverse effect on the distribution and concentration of industry. In individual cases, that influence may be so considerable that the erroneous impression is created that a definite distribution of population brings about a definite distribution of production. That impression arises, for instance, when we see how certain industries are attracted to big cities, how the distribution of the production of certain consumer goods hinges on population patterns, and so on. It should also be taken into account that, apart from purely industrial consideration, population geography is also determined in considerable measure by many social phenomena that pertain to the superstructure (legal relations, political formations, and so on).

The unity of production and reproduction should be taken into account in an analysis of the factors determining population distribution. The normal functioning of society requires a whole range of so-called "non-industrial activities", which are linked with the upbringing of new generations, with the realm of culture in its various manifestations, and finally with branches serving the entire population in the latter's capacity of society's main productive forces. It is those services that determine the close link between population geography and a new discipline: the geography of the sphere of the public

services. The role of the latter in the complex of geographical disciplines cannot but grow in the conditions of the scientific and technological revolution, in which an ever greater proportion of the population becomes involved in the branches of the infrastructure.

We shall note, incidentally, that the "non-industrial" or "non-material" sphere of activities is inevitably "materialised" in practice, in the form of various and sometimes highly substantial buildings, such as schools and universities, hospitals, radio and TV broadcasting stations, and so on. The role of these elements, which are necessary to the processes of social production and are linked with the superstructure, is growing in the historical sense, especially in developed socialist society. Such elements are territorially concentrated mainly in cities, especially the big ones.

The overall patterns of the industrial and territorial redistribution of social labour (and consequently of those population contingents that provide such labour) are expressed in shifts towards ever more efficient forms of labour expenditures. That trend is manifested, in particular, in the relative decline in the number of those engaged in agriculture, and the increase in the number engaged in industry. At the same time the amount of power and machinery per industrial worker is displaying an exponential rise which, in the area of population distribution, means a higher concentration of population at certain focuses, or, in practical terms, in the growing degree of urbanisation.

Inasmuch as the socio-territorial division of labour finds expression in urbanisation, we find ourselves, in this respect, at the intersection of notions pertaining to sociology, demography, economics and economic geography. I shall note here that the concept of the "division of labour" should not restrict our ideas of the origins and nature of urbanisation merely to production proper. The "pulling out" of urban formations from the entire habitancy and the economic pattern of a country or a region is effected in the entire process of the social reproduction of life, and is conditioned not only by purely industrial functions but also by many that are non-material, and often pertain to the superstructure.

The concentration of industries and people in a limited number of localities always seems to have an impact on a geographically diversified "background", whose features determine how urban formations come into being. In practice, there exists no absolutely homogeneous geographico-economic environment with universally equal conditions for the creation of urban formations and consequently for the development of an "ideal" hierarchy of settlements.

The process of the specific localisation of industries and of people who are engaged in running them or are linked with them indirectly, is a phenomenon that is the opposite of what it is now the vogue to call the entropy of population distribution. This author does not favour the introduction into population geography of terms borrowed from physics; at best, they can serve only as convenient metaphors to describe certain phenomena. In his opinion, it would be sufficient to speak here of centripetal forces resulting from a striving to achieve the highest possible productivity of social labour and to make the

maximum use of the social advantages of concentrating population at points with high potentials of information and communication. But if we must resort to the terminology of physics and (in this case call this phenomenon negentropy), than the opposite trend (which we shall then call entropy) will prove linked with the striving for society's productive forces to occupy the greatest possible area and the greatest possible range of the natural resources. In essence, the entire history of the settlement of the habitat reflects this trend,[4] which takes effect alternately with movements towards concentration of populations and their industrial activities, becoming concentrated where the labour required to process those resources is most available and efficient.

On the historical plane, settlement takes place "in breadth"—on the scale of the entire habitat and extensive regions of the world; however, within any country or its districts negentropy trends predominate, to whose number we must also refer urbanisation as deriving from processes in the concentration of industry. The interaction between these two trends creates the dynamics of population geography in its most general or global expression. This interaction has the appearance of "scintillating" contractions against the background of more general trends towards an even population settlement.

The forms of urbanisation differ in the same way as do socio-economic systems and their various structures; besides, the diversity of the concrete forms of urbanisation is linked with the variety of the socio-geographic conditions, the level achieved in the implementation of what has been achieved in the scientific and technological revolution, and sometimes also with the specific features of the natural environment. Thus the course and rate of urbanisation in the developing countries are determined to the utmost by the agrarian relations in a particular locality: the generally slow decay of the natural economy, the preservation of pre-capitalist relations in the countryside, the impoverishment and ruin of the peasantry, and the pauperisation of its poorer sections. In the conditions of a one-sided specialisation of the economy in respect of agriculture and raw materials, and of the slow rates of industrialisation, the "flight" of the peasants to the urban centres gives them no relief; on the contrary, it often subjects them to fresh privations, unemployment and homeless beggary. In the Third World countries vast hypertrophied cities are rapidly developing, whose ability to develop normally in the economic sense has given reason for a number of geographers to designate such processes as "pseudo-urbanisation".

In any study of the processes of "true" or "pseudo"-urbanisation it is important not only to reach agreement on what we are to understand by the term "city" (it is common knowledge that the criteria of that concept differ in various countries) but also to penetrate into the very nature of the city of today as a social institution. Some Western authors refuse to recognise any urban "essence" even in heavily populated settlements if they are unifunctional. Thus, the French researcher Max Sorre has called such cities

"industrial villages".[5] This negation can, in our opinion, be explained by the social role of a city being erroneously seen only in its commercial and service functions. In reality, however, the scale and ramified nature of the services industry are almost a secondary consequence of the *size* (populousness) of a city, the latter being ultimately determined by the volume of the *production* carried on there, that being understood in the broadest sense, including the production of spiritual values.

However, there is a certain rational kernel in an economico-geographical contraposition of city and countryside according to the great plurality of functions in the former and their narrow range in the latter. That is because any sufficiently mature city inevitably accumulates a variety of functions, this because of the build-up in its economic and cultural role and the latters' frequent modifications; even functions that wither away always leave some traces behind them. The countryside is, in the first place, far poorer in functions, and in the second place, hardly knows any dynamism in the latter's development.

Many urbanists are inclined to fit cities into definite rationalist moulds. However, in any developed city, especially if it is big, there always seems to exist a principle of "irrationality", this because of the great variety of its functions and the concentration of large masses of people. It is obvious that this feature must also develop in the epoch of the scientific and technological revolution.

The industrial and day-by-day rhythm and the entire schedule of the internal movement of the rural population as well as of the "immature" urban population are predetermined just as inexorably as the daily rise of the sun. Matters are quite different in a developed city, which is marked by continually "pulsating" transitions from social and industrially *organised* human aggregations (personnel engaged in activities at enterprises, audiences at theatres and cinemas, students in classrooms and so on) to "amorphostatistical" aggregations that are *stochastically* governed by the laws of large numbers. Therein lies the interpenetration of the rational and irrational principles in the spatial course of urban life. These pulsating transitions take place within the framework of one and the same material and planning array. The network of urban arteries, the means of urban transport and the various shops and other emporia are marked now by regular ebbs and flows of people going to or returning from their places of work, now by chance currents that obey a multitude of factors which are difficult to predict. Such ebbs and flows give urban life its irrationality, while the fixed material forms of the city squeeze the irrational plane of many motivations into a framework of rationally restricted city blocks, streets, parks, means of transportation, and so on.

Since the population is the most "social" element of economic geography, it is not surprising that the appraisal of its role in development becomes a line of division in ideological discussions, the decisive role here usually being played by differences in the understanding of the interaction between Nature and Society. Vulgar

determinist concepts of the role of Nature in that interaction engendered the well-known German school of anthropogeography (whose scribbles were widely used by the nazi geo-politicians to justify the Hitlerite aggression), and later the North-American school of environmentalism. Both these schools declared — the former undisguisedly and the latter in a more veiled form — that natural conditions are the decisive factor in the development of society, but ignored the circumstance that the influence of those conditions is always mediated by industry, and can make itself felt only after passing through a historically mature mode of production.

The determinist-mechanist concept in Western literature coexists with the desire to express social phenomena in the form of mathematical relationships. It is not, of course, the mathematical presentation that evokes objections from Marxists; on the contrary, mathematical methods can and should become an important instrument of a scientific analysis of reality in the conditions of the scientific and technological revolution; they are essential in transforming the massive streams of information on discrete phenomena into discoveries of "overall" trends. The argument is not over the mathematical "packaging" of the patterns in population geography, but over the understanding of their socio-economic nature.

Any unjustified formalisation of processes and phenomena connected with population, this without due account of the qualitative factors, and in the first place of the social organisation of society, leads to erroneous scientific conclusions. In particular, that kind of approach is galvanising Malthusian views that engender "ecological pessimism". That methodological weakness is characteristic, for example, of the well-known work by the two Meadowses and their co-authors, under the title of *The Limits to Growth*, which has come in for much justified criticism from the scientific community, and not only from Marxist scholars.

In the Soviet Union, the development of population geography will proceed with due account of all the trends mentioned above, with special stress on the links between population settlement and the geography of the population's economic activities and the distribution of the socialist productive forces. That will proceed in incisively accomplished planned tasks, and not as something elemental and unrealised. Population settlement and the distribution of industry in the USSR are seen as a single problem of the organisation of territory. That singleness and unity can be seen most distinctly where the assimilation of new natural resources takes place according to plan; such assimilation always goes hand in hand with the creation of new systems of settlement appropriate to the tasks set. A good illustration is provided by a planned assimilation of the oil and gas resources in the northern part of West Siberia, in the course of which systems of cities and other settlements are evolved in a rational hierarchical system. In the same way, long-term plans are being implemented for the settling of the area along the Baikal-Amur railway, that tremendous transport project of the 20th century.

These vast projects are workshops for the verification and further development of the scientific trends we have spoken of above, for instance, for an analysis of optimum models of human settlement in conditions unfavourable to habitation.

However, the unity in the pattern of settlement and the nature of the economic set-up can also be seen in the long established and densely populated territories of the USSR. It is there that (incidentally with even greater force than in the newly assimilated territories) there manifests itself the attraction of both population and industry towards centres of communications, the active exchange of information and the creation of scientific production. Distinct expression is given to the ever mounting role of science in industry and the conversion of science into a direct productive force; and on the other hand to the fact that individuals, the population, have become vectors and creators of scientific knowledge. The territorial-production complexes into which industry and agriculture are organised in the USSR are at the same time always systems of settlement; what has just been said about the special role played in such territorial complexes by the chief focuses of information exchange and the production of scientific knowledge can also be interpreted in a different light — as indicative of a special role in systems of urban settlement, especially of big cities. It is there that vast opportunities present themselves for creative contacts between the hundreds of thousands of people living there; it is there that population geography can also study the variety of social consequences of such a "multi-contact" way of life of an ever greater part of the country's population. This is yet another aspect of the study of the geographical aspects of urbanisation.

The concentration of people and industrial potentials in a limited number of points (which ensures higher labour productivity) is effected through the mechanisms of population redistribution via migration. This comprises another group of subjects which have acquired ever greater significance in the geography of the USSR's population in view of such migrations taking place over vast distances and being accompanied by the adaptation of considerable segments of the population, not only to a different "social climate" (the shift from rural to urban conditions) but also to completely different natural conditions of habitation.

Of course, both current and long-term plans have a decisive part to play — through their implementation — in determining all the features of present-day and foreseeable population geography in the USSR. Herein lies the special nature of the development of population geography in the Soviet Union, as well as in the European socialist countries, that nature finding expression, for instance, in the important role played by regional planning whose schemes provide for the coordinated localisation, on actively utilised territory, of industries, built-up areas, transport facilities, the appropriate conditions for recreation and tourism, and so on. In the same way, the main objective in the study of migration processes is the achievement of control of their mechanisms, and their planned government. That is

how, in a developed socialist society, population geography — like the other geographical disciplines — is grounded in the constructive principle.

Solutions based on constructive planning are also being found for the ecological problems that loom so large throughout the world. Throughout the USSR, including its densely populated and highly industrialised areas, where such problems are of particular urgency, the planned forms of economic management and control of social processes ensure rational solutions of local ecological problems. However, there are also global phenomena which call for solution on a worldwide scale. These are matters of profound concern to scientists in the socialist countries, both in the matter of extending constructive approaches beyond the borders of the socialist community, and in the encouragement of progressive trends in world science.

Population geography has to deal with mass material that presents itself as a totality of discrete phenomena — "monads" — in the shape of individuals, then settlements, cities and entire systems of settlements. Through a multitude of discrete data provided by such "sensors", science has to "develop" the overall picture as though on fine-grain photographic film. This author is convinced that to the geographer the acme of satisfaction (as, incidentally, to any scientist) is a special kind of "scientific experience": the discovery of an overall and law-governed pattern in a multitude of individual phenomena. But the reverse is also true of the geographer: the joy of discovering "physiognomic" individualities within the framework of cause-effect patterns they have discovered. Because of the nature of the material it has to deal with, population geography opens up boundless opportunities to enjoy the two experiences, and to realise to the utmost the profound dialectical unity of the general and the particular. Of all the departments of geographical knowledge, it is population geography that appeals to us by its humaneness, its dedication to man's welfare. That feature is most conspicuous in the era of the scientific and technological revolution, when there come to the forefront the tasks of ensuring the rational exploitation of the planet's resources by human society, and the implementation of the ideas of socialism is making possible the disappearance of wars, hunger and poverty from the face of the earth.

NOTES

[1] See *Growth of the World's Urban and Rural Population, 1920-2000*, United Nations, New York, 1969.

[2] See, for instance, N. Federici, "A Demographical Model for Europe", *The Future Is Tomorrow*, The Hague, 1972.

[3] W. Ehrenstein. *Probleme des höheren Seelenlebens*, Munich-Basel, 1965, p. 347.

[4] This may be compared with the trend, established by V. Vernadsky for any biological species to strive to occupy the greatest possible area with the greatest possible density of occupation. See V. Vernadsky, "The Biosphere", *Selected Works*, Moscow, Vol. V, 1960 (in Russian).

[5] See M. Sorre, "La géographie des villes", *Scientia*, 1954, No. 2, p. 59.

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Quantitative Methods in Historical Research

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Over the past few years the development of historical science has been marked by ever more extensive use of the latest quantitative and machine methods of research. This has been made possible with the emergence of the third generation of electronic computers, in which electro-magnetic tapes have given place to fast operating discs. These new machines also have a much greater memory volume, which is especially important for the social sciences, where we have to deal with vast data files. Besides, the new hardware makes it possible simultaneously to operate with several data files under several programmes. The input and output of data is also being improved. Optical devices have now been developed to feed data directly into the memory drums of computers without the excessively labour-intensive preliminary perforation.

All of this has produced among historians both a sense of relief and of concern. Relief, because new computers hold promise of a great saving of time and labour for researchers, and together with the new quantitative methods of analysis they open up real prospects for tackling problems which had once been considered insoluble or simply did not arise. Concern, because this new development has revealed much more clearly how complicated the study of social processes is. Recourse to all manner of primary and mass data

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(something that is being done ever more extensively today) has clearly shown the vast range of separate events that constitute these processes and the great number of factors that influence (or can influence) the course of historical development, determining its direction and content.

Sociologists and historians who cannot or will not sort out the great diversity of causes and factors behind social development to get to the root causes and factors tend to regard historical knowledge as being absolutely relative, claiming this to be the distinctive feature of historical science (and of all the social sciences in general), and making use of the situation to bolster the positions of subjectivism and agnosticism. The Dutch historian Pieter Geyl declares: "Nowadays, at all events, the great majority of working historians are aware that certainty in history is beyond the grasp of the human mind. Not only is the multitude of facts staggering, but their nature is acknowledged to be elusive. The fact in history cannot be isolated. In itself it is meaningless; it can be made to show different aspects of meaning only as it is related to different parts of the circumstances in which it is embedded. Causation, too, is not the simple affair which historians of an earlier generation often thought it to be."[1]

There are any number of such statements to be quoted, but even without them it is quite clear that the use of new research methods in historical science was bound to draw attention both to general philosophical-theoretical and to concrete methodological problems, especially to those aspects of these problems which bear on quantitative and machine methods of research. That is the subject of this article, which is not intended to characterise the whole aggregation of the questions that arise, for these are not given once and for all. As the sphere in which the new methods are applied is extended, the range of these questions is bound to change and grow. We intend to deal with what we consider to be the most important problems on whose correct solution the fruitful application of the new methods of research by historians largely depends.

* * *

The first question on which there must be complete clarity in connection with the use of quantitative and machine methods in historical research is the relationship between these methods and theoretical, qualitative analysis. Marxist historians always start from the definitive role of the qualitative, that is, the general theoretical, and the concrete methodological approach based on it.

The initial theoretico-methodological principles and propositions determine the aims, ways and methods of research, and it is on their basis that the facts are selected, analysed and generalised, that is, theory is the definitive component of scientific research.

Undoubtedly important and positive is the fact that prominent non-Marxist historians, who apply the latest methods in their research, also accept the definitive role of a correct theoretical

formulation and consideration of the problems being studied. Thus, the Swedish scientists Carl Göran Andrae and Swen Lundkvist, who made a report at the 13th International Congress of Historical Sciences in Moscow, stressed that "the methods may be perfect, but the thought behind them be wrong and then the results will be wrong."[2] A French researcher, Jean Schneider, said in his report at the same congress: "In historical research, the recourse to machines will be a factor of progress only to the extent that the work is dominated by methodological reflection. It has become a cliché to say that the machine will yield only what it is fed."[3]

The same standpoint was supported by E. Le Roy Ladurie (France) and R. W. Fogel (USA), among others, at the International Conference on Quantitative and Machine Methods of Processing Historical Information which was held in Sweden in 1973.

At the same time many Western historiographers deny the leading role of theory in historical research in general and in the use of mathematical and machine methods of analysis in particular. It has been claimed that the extensive use of mathematical methods leads to the establisment of a new "mathematical historical science", which is free from philosophy and is based on pure logic. These attempts are not new at all, and express the urge to muster additional arguments in favour of the effort to substitute simple description and subjective interpretation of social development for scientific social research. The Canadian historian, Alfred Dubuc, was right when he said at the Moscow Congress of Historical Sciences, that "the thesis about the end of ideology—which is camouflaged with calls for objective research—is, in effect, the most ideological of all theses and runs counter to the development of science."[4]

Soviet historians have repeatedly emphasised that there is no ground or need to produce a "new historical science" and that the use of new methods of research can be fruitful above all on the basis of historical materialism and the dialectical method of cognition.[5]

Another important general question that needs to be answered before we can get down to a consideration of concrete methodological problems is whether quantitative methods can be used in historical research, in what way and to what extent.

In present-day Western historiography the advocates of subjectivist conceptions naturally balk at the use of the latest, including mathematical, methods in historical research (and in social research in general), because in one way or another these methods tend to limit the arbitrariness inherent in these conceptions, whatever the arguments used to cover up the fact. The subjectivists have rejected the new methods, you might say, in principle.

Another group of opponents of the new methods consists of those who make an absolute of the real obstacles in the way of these methods. Thus, the US historian of the economy, Elias H. Tuma, declares that one barrier to their use is that vast areas of research lack the quantitative and theoretical qualification that permits a mathematical treatment.[6] This is true, indeed, but the genuine

scientific approach to the problem, we think, is not to reject the new methods but to seek ways of applying them.

While admitting that it is worthwhile to turn to the new methods, some researchers have expressed the apprehension that one would have to forego so many details that one would perhaps throw out the child with the bath-water.[7] This is an important point, if one assumes that all social phenomena are to be formalised and assessed quantitatively, while mathematical methods are to become the universal and sole means of historical research.

We think that the question of the limits within which quantitative analysis is to be used in historical research should be decided depending, first, on the content of social development and the specifics of its various aspects and manifestations; second, on the aims of historical science and the concrete tasks of research; and third, on the nature of the data available, and above all the possibility of formalising these and expressing them in quantitative terms. This approach will make it impossible to turn quantitative methods into absolutes, thereby meeting the objections against their use. At the same time, it helps to demermine the spheres in which efforts in the use of these methods should be concentrated.

It appears to be obvious that there is no need to apply quantitative methods to the study of some aspects and manifestations of historical development. The whole aggregation of social phenomena can be divided into a number of categories. First of all, there is everything that expresses the objective and natural, intrinsically conditioned character of historical development, or in other words, all that characterises social life as an aggregation of different systems with their inherent structures and as a process expressed in a definite dynamic, that is, above all the sphere of socio-economic phenomena. Then comes the very important category of phenomena which are subjective in form but are objective and social in content. This is the sphere of socio-political and socio-ideological phenomena. Finally, there is the combination of many specific, individual and unique events and phenomena.

It goes without saying that the ways and methods in analysing these manifestations of historical development need to be different. In analysing social systems and their structures, historical processes and their dynamic, for the purpose of showing the objective and law-governed nature of historical development, it is not only right but necessary to abstract oneself from the accidental and the specific. Otherwise it is impossible to show their character and their intrinsic substance. Let us recall what Marx once said about the general law operating as "the prevailing tendency only in a very complicated and approximate manner, as a never ascertainable average of ceaseless fluctuations."[8] It is quite clear that this is the line of historical research that should above all make use of quantitative methods. Such research is, as a rule, based on the study of mass objects and phenomena and always includes generalising, synthetic constructions and conclusions showing the basic intrinsic substance of the social systems and processes under consideration.

The study of the unique and the individual is quite another matter, for here any details may be the subject of analysis, and so have to be treated with care. Of course, even here quantitative and machine methods can be used, as in the analysis of the language and style of an author or a work. But, first of all, their use here is not based on abstraction from the particular, but precisely on its consideration; and second, in the study of such phenomena their simple description and sensory-empirical comprehension and interpretation will always have an important role to play.

Thus, in arguing the need to use the latest quantitative methods in historical research and in extending the sphere of their application, there is no need to deny or to underrate the traditional methods. Any method of research has its own range of effective action, and a clear understanding of this will prevent historians from overrating or underrating any methods of research. The method used must correspond to the research task. These methods should not be complicated where more simple means can help to achieve one's aim (and that is a fault frequently to be found among the most dedicated advocates of the new method). But equally it is not right to confine oneself to traditional methods where the new methods can yield a greater effect. That is why one cannot accept the sceptical attitude on the part of some historians to the latest methods only because these have not yet become part and parcel of day-to-day practice or are not always easy to understand and apply.

Mathematical research methods have a number of obvious advantages. First of all, they enable the historian to obtain quantitative characteristics of the phenomena and processes he is studying in areas and from angles not accessible to conventional methods. This applies primarily to the sphere of interconnections, which historians tend to analyse perhaps most of all. Furthermore, the researcher is able not only to obtain quantitative indicators but also in many cases to judge how precise and authentic these are in characterising the corresponding phenomena and processes. This is especially important when one has to confine oneself to extant data, which is normal practice in historical research. In analysing large bodies of data, which it is hard or inexpedient to process, mathematical methods make it possible to operate with samples and to obtain generalised indicators on their basis. Finally, quantitative methods pave the way for a synthetic characteristic of current individual phenomena and aspects of social life and in the long term, of whole periods of historical development. This is made possible by mathematical modelling.

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Another range of methodological problems which arise in the use of mathematical methods is connected with the formulation of research tasks, the selection of the tokens and indicators to be analysed, and their measurement. Historians making use of traditional methods also have to face these questions, but the importance of their correct solution through the use of mathematical methods tends to grow immensely.

It is clear that the formulation of a research task must, in any case, proceed from the urge to comprehend the given process or phenomenon in all its internal complexity and external mediation, that is, the objective scientific approach requires consideration of the object of research "(α) only historically; (β) only in connection with others; (γ) only in connection with the concrete experience of history."[9] These principles are self-evident, but it is not always easy to realise them in practice, and that is so not only because of the complexity of social development but also because in their study of the past modern historians tend to start not from scratch but from the facts, observations and conclusions already current in science. This naturally has an effect on the formulation of their research task. There is the danger of a subjective approach to that task, which may amount to a mistake.

In order to avoid such mistakes, we think, there is need, first, to refrain from taking either the nihilist or the conservative attitude to the results of historical research already achieved. That is why R. Fogel is not right when he assumes that the use of the new methods would yield primitive results if it reproduced the old conclusions.[10] In science, advance does not only amount to the obtaining of new conclusions, but also to the confirmation of old conclusions on a new basis. Second, the formulation of a task should not start from an urge to obtain a subjectively desired result. It should aim to extend and deepen the approach to the object being studied on the basis of its theoretical analysis and comprehensive generalisation of earlier studies. That is what will primarily determine the effectiveness of the new methods.

Here is one example. In the past few years, US historians and economists have concentrated on the comparative analysis of two economic systems of the mid-19th century: the plantation economy based on slave labour and agricultural production based on free labour. Some writings based on the latest methods contested the traditional conclusion that slave labour was unprofitable and economically disadvantageous. Having compared slave labour in the South of the USA with free labour in the North, these authors reached the conclusion that the former was highly efficient in economic terms and claimed that slavery was not abolished for economic reasons, but for reasons of morality and justice.[11] While allowing that the calculations were correct in themselves, we must nevertheless recognise that the question of the comparative efficiency of the slave-holding system and the free-labour system remains unanswered because of the narrow approach. Indeed, the question of slave and free labour was considered only in terms of relative economic profitability, no account having been taken of the relative merits of these systems in terms of functioning, social interests and prospects for economic development. The authors failed to see the fact that slave labour justified itself only "on wide expanses of a naturally fertile soil, that

requires only simple labour", and that "intensive cultivation, which depends less on fertility of the soil than on investment of capital, intelligence and energy of labour, is contrary to the nature of slavery."[12] The slave and the free-labour systems existed in such different conditions that any direct comparison between them is hardly possible. The result would have been very different in a comparison under equal conditions (for instance, those that existed in the newly developed lands of the West) and with an eye to the prospects of historical development (the tendency towards intensification of farming).

The US researchers must have well realised the importance of all these points, and it is possible that their subjective urge to refute the traditional standpoint prevented them from taking an objective approach to the problem.

At the stage of data selection to tackle the formulated task, the question of the representative nature of the data is of paramount importance. Whenever the historian has the possibility of applying the sample method proper, that is, of taking the necessary samples of data from their whole aggregation, the representative nature of the data is ensured by random selection and the volume of the sample corresponding to the required precision and authenticity. The ways of taking such samples have been well elaborated in the random method theory, which is an important section of mathematical statistics.

It is a much more difficult matter when the historian has to operate with the data of so-called "natural samples", that is, when he has to rely on a mass of data that has been preserved or is accessible to research. Such samples may be casual and not large enough in volume to ensure the necessary accuracy and authenticity. But they may not be such on all occasions. Consequently, there is need here for special verification. There appears to be no difficulty in establishing to what extent the volume of the sample ensures the acceptable authenticity and precision, and this may be carried out with the use of methods designed for the sampling method proper. As for verifying the fortuitousness of "natural samples" no sufficiently reliable mathematical means for such verification have yet been developed. Here the historian has to rely on his own historical means and methods (verification of fortuitousness of data from the standpoint of their origin, subsequent processing and storage, etc.).[13]

Whatever the method of research used, the historian always needs to establish how representative the "natural sample" data are, and it is the use of quantitative methods that requires its comprehensive solution. That is why there is need further to elaborate the principles and methods for establishing the representative nature of "natural sample" data.

When analysing a process or phenomenon with the use of the relevant sources, the historian always brings out definite tokens which characterise these processes and phenomena. The choice of these can be based on qualitative analysis involving consideration of the substance of the objects being analysed and the task to be resolved. What is especially important and complicated is the

selection of tokens when these abound in the sources, and the success of the study largely depends, first, on the extent to which the tokens which characterise the basic features of the given phenomena and processes are identified, and second, on how truly their hierarchy—mutual subordination—is established.

Many advocates of structural analysis assume that all the components of social systems have the same value and equally characterise their structure. This produces the illusion that there is need to consider the greatest possible number of tokens. However, any mechanical increase in the number of analysed tokens, far from helping to solve the problem, could in effect hamper its solution. That is why there is need for a thorough preliminary selection of tokens on the basis of profound qualitative analysis. Let us stress that both the correct selection of tokens and establishment of their subordination can be largely facilitated by the use of mathematical methods. That is why it is extremely useful to have preliminary processing and analysis of sample aggregations in research providing for the use of extensive concrete material, for this helps, in combination with qualitative analysis, to make a well-grounded selection of the necessary tokens and map out the ways of showing their interconnection. That is precisely what has been done, for instance, by the Soviet historians V. Drobizhev and A. Sokolov in using the data of a 1918 occupational census to study the social structure of the working class. The primary data of this census come to over one million census cards. They started with an ordinary sample, and the processing of these data was to help determine the subsequently necessary proportion of sampling and the tokens that were most important for characterising the social structure of the working class. Altogether there were 65 different characteristics on the census card, and an analysis of the interconnection between them on the strength of the sampling showed that for an analysis of the social structure their number could be reduced to 26. Subsequent samplings involved an analysis only of these characteristics. At the same time the test sampling helped to establish the hierarchy of the characteristics, that is, to bring out the most important ones and also to determine the necessary proportion of the sampling.[14] All of this helped to carry out the further processing of a large data array most efficiently and purposefully. By using the mechanical-type method of selection the researchers processed 11,000 forms (that is, roughly 1 per cent of the total) and obtained representative data on the social structure of the working class.

In selecting characteristics it is important to avoid inclusion among them of such that do not give any useful information for the task in question and also to ensure the necessary minimum of characteristics without which it is impossible to reveal the basic substance of the phenomena and processes being studied. Otherwise, this may result in unfounded and erroneous conclusions. Here is an example. At the above-mentioned conference in Sweden, a group of young American historians presented a paper on the social structure of the population in several US cities in the middle of the last century. Population censuses were their main source. They used mathematical methods to

study the interconnection between various characteristics. One of their main conclusions turned out to be that nationality was a key factor which determined the status of citizens. Thus, more skilled occupations were widespread among the Germans (many of them were blacksmiths), while workers of lower skills prevailed among the Irish (among whom there were many ditch-diggers). This conclusion was made without any consideration of the status and occupation of the population in the past, before emigration to the USA, for the sources they used did not contain such information. As a result, the researchers, having made a study of the factors which determined the occupational status of the population on the strength of a non-representative selection of characteristics, arrived at unsubstantiated and erroneous conclusions.

It is quite obvious, therefore, that if one is to bring out an aggregation of characteristics for quantitative analysis that is both optimal and representative in quantitative and qualitative terms, one needs to carry out a preliminary and thorough qualitative analysis of the substance of the phenomena and processes being analysed.

Following the selection of characteristics there arises the problem of their quantitative expression. Hence the need to measure them. Historians now tackle the problem of measurement more or less satisfactorily only where they have to deal with quantitative characteristics that are, as a rule, reflected in the sources in numerical terms. But even a characteristic of economic phenomena and processes must frequently go beyond quantitative indicators on to qualitative ones. Unless the latter are considered and measured, one may find it impossible to analyse the given objects. That is why measurement becomes one of the central problems in the methodology of historical science.

Theoretically speaking, it cannot be ruled out that all the expressions of social life which have variously influenced the course of historical development, that is, which have had their objective results, can be measured and expressed in quantitative terms. The whole point, therefore, is to what extent it is possible in practice to carry out such measurement with the concrete-methodological and technical facilities which the historian has at his disposal. For the time being, these facilities are scarce and the skills in measuring qualitative characteristics highly imperfect. One expression of this imperfection is that historians very frequently use simple counts as a universal means of measurement, without taking stock of the fundamental distinction between the measurement of quantitative and qualitative characteristics. While the parameters of the former may well be expressed through counting, in the latter case it is mostly far from being sufficient.

Historians and sociologists have been seeking ways and means of measuring various aspects and expressions of social life, and some success has been attained in this area. Thus, there are marked advances in formalising and measuring political phenomena, where extensive use is being made of the method of expert evaluations of qualitative characteristics, with various scales used to give them quantitative expression.

In view of the broad interest among historians in popular movements, much attention over the past few years has been given to the question of measuring the scope and strength of these movements. B. Litvak, having generalised the experience of other Soviet historians, has suggested that a distinction should be drawn between the forms of peasant action, with account being taken of their scope in the villages involved in the movement.[15] The historians E. Hobsbawm and Y. Rudé have suggested a calculation of riot-days (the number of participants multiplied by the number of disturbance days).[16]

We accept the views expressed by many Soviet historians and believe that in studying the strength of anti-feudal struggles it is the landed estate that should be taken as the unit of measurement in the first place (there will be several units where one landlord has several estates). The feudal possessions are peculiar nerve ganglions of the feudal social system, and when one of them is involved in an anti-feudal riot, that ganglion is affected, temporarily, at any rate. The greater the number of nerve ganglions that are affected, the stronger and more dangerous is the peasant movement for the ruling class. In its marginal expression it could well prove to be the key factor in the emergence of a revo utionary situation (as was the case, for instance, in Russia in the mid-19th century).

At the same time, however, this kind of statistical measurement of the strength of anti-feudal struggle is legitimate only when we apply it in a horizontal section, that is, when we compare the strength of peasant disturbances in different areas, but occurring at roughly the same time. For as soon as we begin to compare the strength of peasant movements in different epochs, we cannot help violating the principle of historism. After all, are we entitled to claim, for instance, that a disturbance involving 100 estates in some area of Central Russia in the late 18th century and another involving an equal number of estates in the 1850s are of equal strength (and present an equal danger to the ruling classes)? Quite obviously, these disturbances cannot be equated. How are we to compare and express in commensurate terms the psychological and other influence exerted by the peasant movement, say, on the entourage of Tsar Paul I, and, say, on the senior civil servants of Tsar Nicholas I and Alexander II? How are we to bring out and compare the impact of this movement on the nature of agrarian policy, etc.? In other words, the overall evaluation of peasant movements is imperfect for the time being. It fails to provide standard quantitative indicators of the strength of movements, and this hampers their statistical analysis and inclusion of the data on popular movements in social development models. Such evaluations will perhaps be subsequently obtained through a combination of qualitative analysis of the scope of the movement and a quantitative evaluation of the bitterness of the struggle. The latter could be obtained on the basis of a definite scale based on a consideration of the strength of various forms of struggle, differentiated within a system of qualitative evaluations (temper of the struggle: very strong,

strong, moderate, weak, very weak, etc.). The complexity of the task consists in finding well-grounded intervals (a system of scales) for the quantitative evaluation of qualitative characteristics. This problem cannot, probably, be solved without a consideration of the objective results of popular movements, but that is one of the most complicated and least analysed aspects of the history of the class struggle.

We have gone in such detail into the question of measuring the peasantry's class struggle because it is an example which shows very well what a long way historians still have to go before they are able to give precise quantitative evaluation even of phenomena which have been relatively well studied.

The formulation of a system of scales for the quantitative evaluation of qualitative characteristics combined with a consideration of the scope of the phenomena which can be expressed statistically, makes it possible to measure many expressions of social life. But along this path historians have yet to overcome many obstacles and solve a whole package of methodological and concrete historical problems.

One special problem is the formalisation and quantitative evaluation of individual notions and concepts as recorded in the numerous narrative sources, both official and individual, and also quantitative analysis in textology, palaeography and other similar areas. For the time being, Soviet historians have taken only the first few steps in this direction.[17] This also produces a number of complicated problems which need to be specially discussed.

The selection of a level on which the measurement is to be taken and the determination of a scale of the periods to be compared in studying the dynamics of various processes is a problem that is closely connected with the problem of measuring the objects of historical research. Thus, it is well known that the extent to which various characteristics are interconnected may vary considerably, depending on the level on which the characteristics are measured. For instance, the various aspects of landed estates or peasant farms may be measured on the level of individual units, on the mean level of small districts and on the level of larger administrative units. We find that the interconnection of characteristics becomes closer and more stable with the amalgamation of initial statistical units, for the averaging out will tend to eliminate the deviating influence of casual factors. The nature of the dynamics of the processes under study will also be more pronounced as the periods being compared are lengthened (for years, five-year periods, decades, etc.). At the same time, the use of initial units of phenomena and processes (say, peasant farms and landed estates as such) gives a more concrete and detailed idea of their substance.

The selected levels and scales of measurement must be comparable and should allow comparison in time and space. For this there is need to measure the same parameters, on the same level and on an equal scale.

All of this requires thorough substantiation of the selected levels and scales of measurement, mainly with an eye on the substance of

the objects being analysed and in the light of the research task, instead of looking to the selected method of quantitative analysis, although its properties also need to be reckoned with.

* * *

Mathematical-theoretical analysis is the main stage in the use of quantitative methods, and it may be divided into the following stages:

a) formulation of hypotheses and structuring of corresponding theoretical models;

b) structuring of quantitative models and their treatment on the basis of information selected from the sources;

c) analysis and generalisation of the results obtained and definition of the sphere in which the conclusions apply.

Here one also has to tackle a number of methodological problems.

First of all, there is the problem of the object of modelling and the types of models which can be applied in historical research. The question is to what extent it is right, in studying historical development, to construct models characterising not only the actual historical processes and phenomena, but also alternative hypothetical models reproducing potential but historically unrealised tendencies and also alternative simulation models imitating historical situations.

The modelling of real historical situations is undoubtedly admissible and necessary. The only important thing here is that the model should be based on a theoretical conception giving allround expression to the substance of the process or phenomenon being studied, and that it should not start from the method of their analytical, that is, mathematical, expression. Different versions of such models can be classified under two heads: structural models and dynamic models. The former have been applied on some scale in historical research, while the latter have, in effect, yet to be applied. The formulation of dynamic models both in historical and mathematical terms is much more complicated than that of structural models, which is why Soviet historians have for the time being studied dynamics with the aid of structural models which fix the state of a process at various moments in time.

In the sphere of modelling, Soviet historians have concentrated on the construction of models characterising the real content and course of social development. It is not possible, or necessary, to describe these models here. They characterise the internal system of the peasant and landowner economy in pre-revolutionary Russia, the social structure of the Soviet working class and peasantry and other phenomena and are, as a rule, based on mass data which have been little used by historians before.

The use of alternative hypothetical models in historical research is quite admissible. These characterise the latent historical phenomena and processes, which were not realised for various reasons. The purpose of modelling such phenomena and processes is to obtain a deeper understanding of the actual course of development. We find a

good example of the hypothetical model, an alternative to the actual course of development, in Lenin's writings on the agrarian history of Russia in the early 20th century.[18] Lenin contrasted the actual course of agrarian evolution with a hypothetical alternative of development without landed estates. The model of this alternative, which was based on the actual struggle within Russia's agrarian system of two ways of agrarian evolution (the bourgeois-peasant and the bourgeois-landowner way) gave a deeper understanding of the course of this evolution.

Hypothetical alternative models should be based on the same principles as real models, that is, here too the theoretical model and its formalised expression must be based on actual tendencies of development.

Much credit in structuring alternative hypothetical models with extensive use of mathematical-statistical methods goes to R. Fogel and his American colleagues. Although the purpose and theoretical principles of the proposed models cannot be accepted,[19] their methods and technical aspects deserve attention and can be used in structuring other models.

Finally, concerning alternative simulation models imitating situations which do not follow from the actual course of historical development. The theory of games is the sphere where these models have appeared and have been most broadly applied. It is known to be widely used in military science, and also in decision-making and forecasting in the economic, social and political spheres, where these models help to compare all the theoretically acceptable variants of situations and to determine on that basis optimal decisions or prospects of development.

Analysis of the past is another matter. Here the task of science is to explain what took place and why. That is why the modelling of situations not based on the actual course of development or its possible tendencies could lead the historian away from his main task and open up the way for arbitrary interpretations of this development. We believe that historians who object to this kind of modelling and call these models illusory fruits of the imagination[20] are right. It is true that when rejecting simulation models, one should not confuse them with alternative hypothetical models. When dealing with alternative quantitative models we do not refer here to the complicated problems arising from the analysis of the possible and actual place of alternative development in history and historical science, for this is a subject that needs special consideration.

A clear idea of the object of historical modelling and the possible types of models is obviously an important condition for successfully applying models in historical research. Because models are formalised quantitative expressions of the theoretical understanding of the substance of the phenomena and processes being studied, the selection of the type of model and the definition of the meaning of its historical substance are carried out on the basis of preliminary qualitative analysis of these phenomena and processes. Indeed, this is the first of the above-mentioned stages of modelling.

At the second stage of structuring formalised quantitative models there is need above all to solve the problem of the extent to which the mathematical formalism on which the model is structured is a correct reflection of the substance of the phenomena and processes being modelled, how adequately it reproduces them. With that end in view, the historian must understand the logical substance of the mathematical methods used and know the conditions in which they could be applied, for despite their universality, mathematical functions, systems of equations, inequalities, etc., each have their own ambit which should range over the entire sphere of the phenomena and processes being modelled. Otherwise, there is the danger that a part may be taken for the whole and the essential.

Successful selection of optimal mathematical formalism also largely depends on qualitative analysis, on the clarity of the theoretical model and the extent to which it expresses the substance of the object of modelling in a historically formalised form.

Historians do not yet have enough experience in verifying the adequacy with which qualitative models reproduce the substance and course of social development. Work in this direction has just been started and even the general principles of such verification have yet to be formulated. The solution of this important problem calls for theoretical and concrete-historical studies.

Because many mathematical-statistical methods are based on the law of large numbers, and on normal distribution, there is need above all to study the extent to which this law manifests itself in social life.

In the sphere of socio-economic phenomena, the law of large numbers operates in a modified form. Being subject to definite regularities or some essential factors, mass phenomena or objects may be grouped otherwise than according to the rules and standards of normal statistical distribution, and may be concentrated in various points or along various lines. But a situation may well arise in which the features of similarity prevail or some determining factors are lacking, as a result of which normal distribution may also occur in the sphere of social life. In social life, the law of large numbers is, in effect, a form in which the dialectical unity of the law-governed and the accidental is expressed.

In his article published in *The New York Daily Tribune* of February 18, 1853, Marx showed very clearly that the statistical law of large numbers is expressed in society as in nature only under definite circumstances, that is, whenever the principal conditions and decisive factors turn out to be so similar that they cause similar results. The determining factor is the similarity of the principal conditions, which is why in such instances these are essentially pseudo-accidents.

The law of large numbers may also be expressed in situations when different factors of socio-economic development appear, in a way, to cancel each other out in the past few years, historical (especially historico-demographic) writings have frequently suggested conclusions to the effect that various socio-historical phenomena do

not depend on the basic factors of socio-economic development. In such instances there is always need to verify whether or not we are dealing with the phenomenon of individual factors cancelling each other; whether a connection that may be lost sight of when excessively large arrays of facts are studied is manifested when more limited objects are considered; whether or not there is a change in the overall picture when we include several new factors in our analysis, etc.

Of course, types of distribution other than the normal may occur in mass social phenomena. Studies of the nature of distribution of mass objects and phenomena in social life will produce the basis for more efficient use of mathematical methods in historical research.

At the third and final stage in the use of quantitative methods, as we have said above, a detailed analysis is made of the results of quantitative processing of data and generalisation of the results of this analysis. This is quite obviously based on the qualitative, dialectical and historico-mathematical approach.

An important task in generalising the results of mathematical analysis and formulating the final conclusions is determination of the sphere to which they can apply. Here the historian should not succumb to the illusion that the scrupulous nature of his analysis will automatically guarantee its authenticity and make it comprehensive.

When correlation or regressive analysis, for instance, is applied to the social sciences, it frequently transpires that the factors whose influence is being studied fail to explain the whole "behaviour" of a social process. If, for instance, correlation analysis indicates that there is a correlation relationship of +0.3 between the number of strikes and the rising cost of living, and that, consequently, the coefficient of determination amounts to only 0.09, this means that the strike struggle depends on the rising cost of living only to a small extent. There are other factors (the activity of political parties, ideological struggle, and so on) which also have a strong impact on the workers' struggle. Consequently, the results of mathematical analysis in this case do not fully show the substance of the phenomena and processes being studied, but merely indicate the "margin of inexplicability" which is caused by the fact that in our analysis we did not have at our disposal either the data on all the essential factors, or that we had failed to take account of them, or yet that we had been altogether unaware of their existence. In such instances, the results of analysis will merely indicate the need to start it all over again, and on a broader basis.

Thus, determination of what we have learned and what remains unknown is a necessary condition for the final stage of quantitative analysis of phenomena and processes.

We find, therefore, that at every stage of quantitative analysis the qualitative approach is the basis and guarantee of the successful application of quantitative methods.

We have dealt here only with some of the broader and more particular methodological problems that arise in the use of quantitative methods in historical research.

NOTES

[1] Pieter Geyl, *Use and Abuse of History*, London, 1955, p. 61.

[2] C. G. Andrae and S. Lundkvist, "The Use of Historical Mass-Data. Experiences from a Project on Swedish Popular Movements", *13th International Congress of Historical Sciences*, Moscow, 1970, p. 220.

[3] J. Schneider, "La machine et l'histoire", ibid., p. 211.

[4] Alfred Dubuc, "L'histoire au carrefour des sciences humaines", ibid., p. 155.

[5] See J. Kahk, "Do We Need a New Historical Science?", *Social Sciences Today*, No. 5, 1969; I. Kovalchenko, "On the Use of Mathematical Methods in Historical Research", *Source Studies; Problems of Methodology*, Moscow, 1968; *Mathematical Methods in Historical Research*, Moscow, 1972 (in Russian).

[6] See Elias H. Tuma, "Economic History and the Social Sciences", *Problems of Methodology*, Berkeley and Los Angeles, 1971, p. 71.

[7] See Robert M. Lynes, "The Role of Models", *Mathematics in Archaeological and Historical Sciences*, Edinburgh, 1971, p. 544.

[8] Karl Marx, *Capital*, Vol. III, Moscow, 1971, p. 161.

[9] V. I. Lenin, *Collected Works*, Moscow, Vol. 35, p. 250.

[10] See R. W. Fogel, "The New Economic History, Its Findings and Methods", *Quantitative History. Selected Readings in the Quantitative Analysis of Historical Data*, Ontario, 1969, p. 322.

[11] Soviet historians have quite rightly qualified this conclusion as an attempt to justify the slave-holding system (See B. Kosachev, "Some Questions of the Economic Development in the First Half of the 19th Century", *Basic Problems of US History in American Historiography from the Colonial Period to the Civil War of 1861-1965*, Moscow, 1971, p. 266 (in Russian).

[12] K. Marx and F. Engels, *The Civil War in the United States*, New York, 1937, p. 67.

[13] Examples of verification of how representative the data of "natural samples" are may be found in I. Kovalchenko's article, "Mathematical-Statistical Processing of Sample Data on the Peasant Economy in Russia in the 19th Century", *Moscow University Bulletin*, No. 1, 1966 (in Russian).

[14] See A. Sokolov, "Methods of Selective Sampling of Primary Data of the 1918 Occupational Census", *Istoria SSSR*, No. 4, 1971, pp. 76-96; V. Drobizhev, A. Sokolov, "The Workers of Petrograd in 1918", *Istoria SSSR*, No. 1, 1973, pp.32-34.

[15] B. Litvak, *Statistical Analysis of the Peasant Movement in Russia in the 19th Century*, Moscow, 1967 (in Russian).

[16] See E. I. Hobsbawm and Y. Rudé, *Captain Swing*, London, 1969.

[17] See, for instance, L. Bragina, "An Investigation of a 15th Century Treaty with the Aid of the Correlation Analysis Method", *Mathematical Methods in Historical Research*, Moscow, 1972 (in Russian).

[18] V. I. Lenin, *Collected Works*, Vol. 13, pp. 228-229.

[19] The US researchers, for instance, have done some very interesting work on comparing the scale of actual development of agricultural production in the USA in the late 19th century, which was achieved at a time of extensive railway construction, and the results that could have been achieved if canals had been built instead of railways. But the alternative model is not designed to explain why it is that railways had become the main type of transport, but to provide evidence that such a radical technical improvement did not essentially have a considerable influence on the course of economic development. Those are the purposes, substantiations and conclusions that we cannot accept (see R. Fogel, op. cit.). We have already mentioned the limitations of the approach to the relative advantages of slave and free labour.

[20] See Fritz Redlich, "New and Traditional Approaches to Economic History and Their Interdependence", *Journal of Economic History*, Vol. XXV, No. 4, December 1965.

Struggle of the Working People of Bessarabia Against the Intervention in 1918

VLADILEN VINOGRADOV

The armed intervention against the then newly-born Soviet Republic began with the invasion of Bessarabia in January 1918. "The forces of imperialism," Leonid Brezhnev noted, "who struck at the young state of workers and peasants, used the ruling classes of the Kingdom of Rumania to keep the territory between the Pruth and the Dniester away from the Soviet Motherland for 22 years."[1] But all these years witnessed an untiring struggle of Bessarabia's multinational population for reunification with the socialist Motherland.

The tragic seizure of Bessarabia in 1918 has received considerable attention in Soviet literature. The authors of the books brought out in the 1920s — participants in the struggle and members of the Communist underground organisations — drew mainly from their own experience. These were mostly works of a publicistic nature eloquently conveying the militant spirit of that epoch. But, as Moldavian historians[2] have justifiably pointed out, the limited sources did not at the time allow Soviet scholars, who had no access to local archives, to give a full picture of the course of events. The official historians of bourgeois- and landowner-ruled Rumania shed no light on these events, on the contrary, they obscured the picture with a heavy curtain of lies.

It took many years of painstaking research, mainly after the Great Patriotic War, to reconstruct the history of the intervention in Bessarabia and the struggle against it. Even today this work cannot be

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regarded as completed, for many of the secrets of the conspiracy against Soviet Russia remain to be unravelled. Research in archives has led to the publication of valuable collections of documents: *The Struggle for Soviet Power in Moldavia, March 1917-March 1918* (Kishinev, 1970), *The Struggle of the Working People of Moldavia Against Interventionists and Internal Counter-Revolution, 1917-1920,* (Kishinev, 1967), *For Soviet Power* (Kishinev, 1970) and *Leaflets of the Communist Underground in Bessarabia, 1918-1940* (Kishinev, 1957), which together with the fundamental work *Documents on Soviet Foreign Policy* have provided a solid foundation for the works that have appeared or are in the process of preparation. The extensive work of scholars has been summed up, in particular, in such generalising publications as *Studies in the History of the Communist Party of Moldavia* (2nd ed., Kishinev, 1968) and *A History of the Moldavian SSR* (2nd ed., Kishinev, 1968).

Soviet historians regard the intervention in Bessarabia not in isolation from but as part of a broad and ramified conspiracy of world imperialism against the Soviet state.

At the close of 1917 the Entente Supreme Council adopted its first official decision to organise the invasion of Russia. Russia was divided into "spheres of influence", with Britain receiving the Cossack regions, the Caucasus and the Transcaucasus, and France getting Bessarabia, the Ukraine and the Crimea. On December 22, by agreement with the Entente diplomats at Jassy and on the direct insistence of the Chief of Staff of the French Military Mission, the Rumanian Government and the Whiteguard General D. Shcherbachov ordered Rumanian troops and the Ukrainian counter-revolutionary gangs to attack the Russian troops in Rumania. The first step towards the occupation of Bessarabia was thus taken by a joint decision of the Entente representatives.

While underscoring the international character of the conspiracy aimed at wresting that territory from Soviet Russia, Soviet historians oppose any attempt to belittle the role played in this act by Rumania's rulers. The Rumanian military, the royal court and the leading bourgeois-landowner circles were quite prepared for the accorded to them role of strangler of the Russian revolution in Bessarabia and began zealously to carry it out. Bucharest had obviously been plotting for a long time to seize Bessarabia. As early as the 1880s the territorial ambitions of Rumanian capital brought it into a military alliance with Germany and Austria-Hungary. The Rumanian bourgeoisie had always sided with the strong. They believed that the alliance of the Central Powers would remain the predominant group in Europe for many years to come.

The Rumanian oligarchy's claims on Bessarabia were revealed in 1905-1907. It endeavoured to use the revolution in Russia to further its own interests. In Bucharest it was decided to place the relative freedom of the press won in Russia in the service of annexationist designs. Rumanian emissaries led by C. Stere were sent to Kishinev, where they organised a printing-house and a newspaper.[3] At the time they did not find any response, not only among the workers and

peasants of multinational Bessarabia who were fighting for social emancipation in the course of the revolution and had no intention of seceding from Russia, but also among the local bourgeoisie, who had deep-rooted ties with the Russian market (the pro-Rumanian feelings of these circles, particularly of the Bessarabian landowners, erupted later when the Great October Socialist Revolution encroached upon their land and capital). Stere had to return home empty-handed.

The Rumanian rulers dreaming of expansion drew conclusions from their experience of 1905-1907. Subsequently, in official Rumanian documents it was frankly or with slight equivocation admitted that nothing came of the attempts to find in Bessarabia the social basis for "unification" with Rumania.[4] Following their setback, the Rumanian emissaries began planting agents in Bessarabia. This was facilitated by, among other things, the invitation to young Moldavians from bourgeois families to attend Rumanian universities "for the acquisition of knowledge". There one of their "enlighteners" was the diehard member of "Black Hundred" A. C. Cuza, who later became one of the founders of Rumanian fascism. In Bucharest, however, they were aware that their plans for Bessarabia could only be carried out with the seizure of that territory.

Meanwhile, the balance of forces in Europe and in the alliance of the Central Powers changed. The Entente took shape as the counter-balance to the German-Austrian imperialist alliance. In the Triple Alliance itself the differences between Rumania and Austria-Hungary mounted. There were nearly 3,000,000 Rumanians in Transylvania and other regions of the empire. Their movement for unification with Rumania aggravated the relations between these allies. The question of which side was strongest gave rise to differences in the Rumanian oligarchy, that continued to orient itself on the stronger power. Hence the policy of "playing at two tables", of manoeuvring between the two imperialist blocs.

When the First World War broke out the former postulate of Rumanian foreign policy—with Austria-Hungary and Germany against Russia—was abandoned. A period of temporising and bargaining commenced. The Germanophile wing, which demanded the seizure of Bessarabia, urged unconditional trust in the German sword, and hoped for Russia's collapse so that Rumania could extend her frontiers to the Bug. However, there were sober voices in Rumania's political circles. Even a hypothetical victory of the Central Powers alarmed the venerable historian A. D. Xenopol, who wrote that the seizure of any part of Russian territory would bring Rumania face to face with an unending threat from Russia, a country with 90 million Russians whom no victory could annihilate. Prime Minister I. Brătianu, Jr. believed that the annexation of Bessarabia would make sense only if the Austro-German coalition firmly seized other Russian regions. But neither he nor the most influential circles of the Rumanian bourgeoisie believed that that was possible. Many people in these circles regarded the plans for Russia's fragmentation as sheer fantasy. However, even after Rumania entered the war on the side of the Entente the plan to seize Bessarabia was not condemned. On the

contrary, it was welcomed but, at the same time, it was regarded as unrealisable at the given moment and in the obtaining situation. This plan of territorial expansion at the expense of a neighbouring country that had now become an ally was simply postponed.

The war brought Rumania's rulers no laurels: the enemy overran two-thirds of the country; only the northeastern regions were held by Rumanian authorities, mainly with the aid of the Russian Army. The Rumanian Army was newly formed only towards the summer of 1917. But when the October Revolution commenced, plans for striking Russia, the ally who had saved the country from total devastation, in the back were devised at Jassy, the temporary Rumanian capital. An active anti-Soviet intervention centre was built up in the city. The seizure of Bessarabia was put on the agenda once again. This was not an easy objective. Soviet historians justifiably name three vital conditions for an attack on this neighbouring country: the armistice with the Austro-German command; the reactionary coup at the front and the overthrow and destruction of the organs of Soviet power in the front area; the suppression of the revolution in Bessarabia.[5]

The reactionary Russian generals at the Rumanian Front and the Rumanian Command refused to subscribe to the general armistice on the Russo-German front that had only just been concluded at Brest-Litovsk, and on December 9, 1917, they signed a separate armistice with the Germans. This act was sanctioned by the Allied missions in Jassy.

But it was a much more difficult task to expel the millions of Russian soldiers from Rumania. There was revolutionary ferment on the Rumanian Front. The tidings about the October Revolution were received with jubilation by the troops.

A plan to unite the internal counter-revolution with external punitive forces was drawn up hastily at the various headquarters and diplomatic offices of the Entente. It was intended to set up a number of counter-revolutionary strongpoints in South Russia: Moldavia was one of them. At the close of 1917 and beginning of 1918 steps were initiated to invade Soviet Russia from the Rumanian territory near the Russian frontier that was not occupied by the Austro-German forces. At Jassy the Entente could count not merely on the sympathy but also on the energetic cooperation of the Rumanian rulers, who had an army of half a million effectives, on which international imperialism pinned much of its hopes.

The Chief of the French Military Mission General C. Berthelot, the Chief of the Rumanian General Staff C. Prezan and the Whiteguard General D. Shcherbachov worked out a plan under which the White Poles and Czechoslovak Corps were to be concentrated in the vicinity of the Rumanian front.

This design was frustrated by the revolutionary events in Russia and on the Rumanian front itself. A Revolutionary Committee that proclaimed itself the highest authority at the front, was set up on December 15 at a conference of Bolsheviks representing the troops in the Jassy-Sokol area (the 4th and 9th armies, and a number of other units). Shcherbachov invited its representatives to his headquarters

on the pretext of negotiations, provoked an incident and called the Rumanian guards. Commissar S. Roshal and some other members of the Revolutionary Committee were arrested. Some days later Roshal's body was found near Jassy. Shcherbachov requested that Rumanians should destroy the "Bolshevik nest" in the Jassy-Sokol area. This request was supported by the Entente's diplomatic and military representatives. The Rumanian Prime Minister Brătianu lost no opportunity to mention his "service" to the "common cause".

At dawn on December 22, 1917, Rumanian troops and Ukrainian counter-revolutionary gangs surrounded and, after a short engagement, disarmed the Russian railway brigade in a suburb of Jassy-Sokol. This was followed by a series of attacks by Rumanian troops on Russian units that were withdrawing from the front and did not expect an "action" of this kind by their recent allies. Later the Rumanian bourgeois historian C. Kiritescu wrote with relish about these "battles", which actually amounted to the massacre of home-bound Russian soldiers: they were taken to concentration camps, deprived of their elected commanders, disarmed and shot. Such is the prehistory of the intervention in Bessarabia.

On December 27, on the pretext of guarding their depots, Rumanian troops seized the small Bessarabian town of Leovo and the surrounding villages and shot the heads of the local Soviet organs. The People's Commissariat for Foreign Affairs of the RSFSR summoned the Rumanian envoy G. Diamandi and protested strongly against this act: "On the territory of the Russian Revolution we shall not tolerate any further repressions not only against Russians but also against Rumanian revolutionaries and Socialists."[6] But this warning had no effect. In an ultimatum signed by Lenin, Krylenko and the People's Commissar for Military Affairs N. Podvoisky the Soviet Government demanded the release of imprisoned soldiers, an end to the unlawful actions, the punishment of the people responsible for these actions and guarantees that such acts would not be repeated.

The ultimatum was broadcast by radio, and on January 16, 1918, it was published in *Pravda* and other newspapers. Moreover, the Council of People's Commissars took extraordinary measures: the Rumanian diplomatic and military missions headed by Diamandi were placed under guard. On the next day led by its doyen, the US Ambassador J. Francis, the entire diplomatic corps in Petrograd which had until then "not recognised" the Soviet Government, called on Lenin. The Soviet Government, which displayed not only firmness but also goodwill and flexibility, obtained from Francis the promise that he would protest against the actions of the Rumanian command, released the Rumanian envoy and demanded the release of the jailed Russian soldiers within three days. But even this step yielded no results. Francis's "indignation" at the actions of the Rumanian military proved to be false. It was soon reported that Rumanian forces had invaded Bessarabia. This prompted the Council of People's Commissars to break off diplomatic relations with Rumania. Diamandi and the entire personnel of the Rumanian mission were expelled from the country and Shcherbachov was outlawed.

* * *

The Entente counted not only on an intervention but also on the fifth column in Bessarabia itself. After receiving their instructions from the Rumanian envoy Diamandi, the "old cadres" (I. Inkulets and P. Erkhan among them) recruited during the First World War arrived in Kishinev at the head of a group of 42 men. The Moldavian Socialist-Revolutionary Party, representing chiefly the rural and urban petty bourgeoisie, was soon formed in the city. The Moldavian National Party, which played a most sinister role in the preparations for the occupation, was formed earlier, in the spring.

Feeling that direct action would not bring success, the Moldavian National Party had recourse to subterfuge. The idea was conceived of holding a Moldavian Military Congress. It was convened in Kishinev on November 2, 1917, on the initiative of bourgeois and petty-bourgeois parties and organisations. It was a strange congress. None of its participants was elected or authorised by anybody. The delegates were selected by the nationalists, who sent invitations to certain groups of officers, to Moldavian soldiers and civilians. The "congress" fulfilled the role assigned to it: it rejected Soviet power and called for the formation of a body called the Sfatul ţarei (Land Council). It took a whole month to select the members of that body. While the Moldavian Military Congress did not represent the peoples inhabiting Bessarabia, the Sfatul ţarei did not represent even the Moldavian Military Congress (only one-fifth of its membership was nominated at the "congress"—the others were "co-opted" at the discretion of a quintette of rabid nationalists headed by Inkulets and Erkhan). They were in a hurry: reports that the authority of the Council of People's Commissars was being recognised were being received from the various districts and towns of Bessarabia and from the Rumanian Front. The Sfatul ţarei assembled under its banner the ill-assorted, nationally heterogeneous counter-revolution in Moldavia, where the Moldavian National Party played first fiddle. The Sfatul ţarei condemned the armed uprising in Petrograd, declared the first decrees of the Soviet power null and void and "banned" the confiscation of the landed estates. It hurriedly drew up an agrarian project envisaging the preservation of the large estates (up to 1,000 hectares per family). In reward the landowners paid it 100,000 rubles for its "solution" of the land question. The Sfatul ţarei ringleaders sought to sow discord among the peoples inhabiting Bessarabia and thereby undermine their revolutionary spirit. In early December, without any authorisation whatever, it proclaimed the creation of the "Moldavian People's Republic" within a federated Russian republic (meaning a bourgeois federation).

However, the Moldavian peasants put Lenin's Decree on Land into effect themselves. The Sfatul ţarei self-appointed leaders endeavoured to use national military units that had been formed shortly before this against the people. But the First Moldavian Regiment flatly refused to take part in suppressing the peasants who had risen against the landowners. The Bessarabian Peasant Congress

rejected the offer of cooperation with the Sfatul ţarei. The peasant faction in the Sfatul ţarei likewise sent a delegation to Petrograd with the mission of declaring its recognition of Soviet power. The affairs of the Sfatul ţarei were not good in the towns either. The numerically small Bessarabian proletariat became the mainstay of Soviet power in Moldavia. At the close of November and beginning of December the Kishinev, Bendery, Ungeny, Brichansk, Oknitsk, Larg and other Soviets and the committees of many regiments, corps and armies of the Rumanian Front pledged total support for the workers' and peasants' government headed by Lenin. Erkhan, who headed the Sfatul ţarei "government", complained: "Our government wields no authority in Moldavia. I beg the Sfatul ţarei to find the resources for organising everything that we need, otherwise everything will be reduced to a scrap of paper."[7]

Why was the parallel existence of Soviets and the Sfatul ţarei possible in the territory? Why did the organs of genuine popular rule reconcile themselves to this self-appointed organisation? This was due solely to the excessive liberalism displayed by the Soviet organs, which were led astray by the subterfuges of the Sfatul ţarei and at first strived to foster democratic tendencies that never existed in that organisation. Later, when they saw its reactionary character they waited for it to expose itself in the eyes of the people. This is shown, in particular, by a resolution adopted by the Kishinev Soviet on December 5, 1917, when the Leninists were still in the minority in it. This resolution encouraged the Sfatul ţarei to such an extent that it set up the notorious Council of General Directors, while its mouthpiece proclaimed that henceforth "all arbitrary organs of executive power existing to this day are stripped of their import, significance and, consequently, authority".[8]

The Front Department of the Rumcherod (Committee of Soldiers', Sailors', Workers' and Peasants' Deputies of the Rumanian Front, Black Sea Fleet and Odessa District) moved to Kishinev on January 10, 1918. On January 14 it took over the telegraph office, the telephone exchange, the radio station and the Kishinev and Ungeny railway stations. Renewed and reinforced with workers deputies, the Kishinev Soviet began to function as the authorised organ of state power. Soviet power was established throughout Bessarabia. The Sfatul ţărei and its directorate were isolated and many of its leaders fled. The discredited Sfatul ţărei leaders had only one means left to them, namely, to request assistance from international imperialism. Erkhan declared that in Bessarabia "anarchy" had assumed "monstrous proportions and it cannot be suppressed locally" and requested that "foreign troops be sent as soon as possible".[9]

Aware of the popular feeling in the territory, the Sfatul ţărei gave the assurance that it did not conceive of Bessarabia's existence except as part of Russia. It went so far as to publish a communique "denying" the rumours that it was conspiring with the Rumanian oligarchy. Inkulets gave an interview at which he said that these rumours were absurd and hypocritically expressed the hope that the Sfatul ţărei would be able to defend the territory "against encroachment by Rumania".[10]

Actually, contact with the Rumanian oligarchy was established within a week after the Sfatul ţarei was formed. The oligarchy's secret envoys visited Jassy, where they were hospitably received. When the archives of bourgeois Rumania became accessible to historians it was found that everything, up to the use of the building in which the Sfatul ţarei had its headquarters and its office expenditures, was paid for by the Rumanian Treasury, which spent a total of over 2,000,000 lei for this purpose. Emissaries were exchanged: representatives of France, Britain, the USA and Rumania arrived in Kishinev ostensibly as an Allied food commission, but actually to contact the local counter-revolutionaries.

When the Sfatul ţarei saw that all its efforts had ended in failure, it requested assistance from Shcherbachov and the "Allies" (i.e., mainly Rumania) against "anarchy". The "invitation" found the interventionists already en route. The above-mentioned bloody incident at Leovo had been provoked. Rumanian troops had seized Kagul and Ungeny and the adjoining villages. The Russian units of the Rumanian Front who might have defended Soviet power in Bessarabia were being disarmed. On January 6, 1918, the very day that Inkulets "angrily" refuted the rumours about an invasion, the Rumanian War Minister General Iancovescu, acting on a decision of his government, ordered a Transylvanian regiment that had been formed in Kiev to march to Kishinev. On January 16, 1918, Prime Minister Brătianu held a conference that was attended by the Head of the French Military Mission General C. Berthelot and Rumanian generals. The question of sending Rumanian troops to Bessarabia was discussed. Everybody realised that this would leave the German front open. The Rumanian General A. Averescu noted that in any case it would be impossible to hold the front after the withdrawal of the Russian troops. On the next day, January 17, the Rumanian Government ordered the invasion of Bessarabia.

While the Sfatul ţarei ringleaders dissembled, the cat was let out of the bag. On January 18, Erkhan was summoned to an enlarged meeting of the Kishinev Soviet to which a representative of the Front Department was invited. The extant minutes of that meeting testify to the fact that the Sfatul ţarei had given its consent to the arrival of Rumanian troops. But no steps were taken. Erkhan made it appear that he had been "slandered" and offended. This took place only hours before the Transylvanian regiment made its attempt to capture Kishinev in the night of January 18-19.

It was only when the invasion became a fact that the Soviet organs took action. The Sfatul ţarei residence was occupied by Soviet troops. The Rumanian officers of the "Allied Food Purchasing Commission", that was gathering intelligence information, were arrested and sent to Odessa. Inkulets and Erkhan were questioned but they got off with nothing more than a fright, claiming that they had nothing to do with the invasion. Continuing to dissemble, they even signed a protest that was sent by telegraph to Shcherbachov and the Rumanian Government. Although nobody was interned by the local

organs of Soviet power, a provocative telegram was sent to Shcherbachov stating that "some members of the Moldavian Government" had been arrested. He immediately acted on this telegram.

* * *

The Rumanian oligarchy intended to strike at Kishinev mainly from the rear, using the units formed at Darnitsa, near Kiev, of Transylvanians, former Austrian and Hungarian prisoners of war. A train-load of volunteers ostensibly on their way to the front aroused less suspicion. But in view of the reports that an invasion was impending, the revolutionary units were on the alert. The attempt of the interventionists to seize the railway station in Kishinev in the night of January 18-19 was beaten off. The local garrison was able to surround and disarm them. At the same time, Rumanian battalions that had de-trained at Gidinich railway station and tried to close in on the Bessarabian capital from the front, were repulsed. Some seven kilometres from Kishinev the battalions were engaged by Soviet units and civilian volunteers. After the fighting, which lasted all night, the Rumanian troops retreated to the Pruth. A setback was also suffered by a Rumanian armoured train near Ungeny railway station and by the Rumanian troops that had broken into Korneshty. Finding that Bessarabia could not be seized by a small force, the Rumanian command began a large-scale operation. Four divisions were sent across the Pruth. Heavy fighting broke out. In the north the interventionists met with fierce resistance from units of the old 8th Army, which had sided with the Soviet power, the local population and the first detachments of the Red Guards.

The Second Ueyzd Congress of Peasants' Deputies opened at Beltsy on January 27 when the invasion was at its height. At the Congress the Sfatul ţărei commissar for the uyezd V. Rudyev publicly dissociated himself from the traitors, declaring: "I am against the odious action of the four-flushers in the Sfatul ţărei: I am a son of a Bessarabian peasant. I shall be among the first to join the forces that will defend our Bessarabia against Rumanian occupation."[11]

The fighting at Kishinev lasted for three days. The revolutionary units withdrew to Bendery only after they had exhausted all their possibilities for resistance. Battles that went on for weeks raged there and in the south of Bessarabia. Only on February 2, after five days of fighting, Rumanian infantry was able to enter Bendery. But the fighting did not end at that. Soviet forces—partisans led by G. Kotovsky, and detachments of sailors from Odessa and Nikolayev—were concentrated on the left bank of the Dniester. They were joined by a battalion of Rumanian internationalists, which had been formed in Odessa by the Rumanian Social-Democratic Action Committee. On February 5 their offensive started. The Red Guards, sailors and internationalists crossed the bridge spanning the Dniester and on the next day they took the Bendery Fortress, driving out the interventionists. The local inhabitants joined in the street fighting.

The Odessa newspaper *Lupta* called this victory the "Rumanian proletariat's baptism of fire at the gates of Bendery".[12]

Two days later the interventionists shelled Bendery, then broke into the town and dealt summarily with the defenders.

In the south the 13th Rumanian Division encountered strong resistance at Bolgrad. The interventionists had to bring up their cavalry into order to capture the town. In Ismail the inhabitants, soldiers and sailors of the local port repulsed the enemy onslaught for four days. In the defence of the port of Kiliya the population was aided by the crews of the Rumanian ships who had mutinied, and by ships of the Danube Flotilla, whose commissar was A. Zheleznyakov. From Kiliya the Soviet forces retreated to the fishing settlement of Vilkov, where the entire population rose to fight the invaders. The settlement was taken by the interventionists on February 28, only after the Rumanian gunboats that approached Vilkov along the river silenced the weapon emplacements. But in the south of Bessarabia the centres of organised resistance held out for a long time. Akkerman continued resisting the enemy until mid-March, when Odessa's capture by Austrian and German troops deprived it of all assistance.

The invaders encountered staunch resistance not only in the towns but also from the Moldavian, Ukrainian, Russian and Bulgarian peasants. Occupied but not subdued, Bessarabia continued resisting. Resolutions protesting against the invasion were adopted at meetings, rallies and peasants' conferences in 722 towns, villages and hamlets. The 3rd Congress of Peasants' Deputies of Bessarabia opened in occupied Kishinev on February 1. The invaders and their Sfatul ţărei lackeys were confident that there would be no protests at the Congress. But the Congress denounced Rumania's occupation of Bessarabia and elected as its chairman V. Rudyev, who was known for his courageous stand against the interventionists and their myrmidons. The invaders did not wait for the "rebellious" Congress to complete its work. They cut it short and arrested many of the delegates. Rudyev and several other delegates were executed. Martial law was proclaimed in the city. In Bendery the "black fence", the name given to the vacant ground between the town and the railway, was used as an execution ground. In small Ismail 1,500 people were arrested, and in Beltsy the invaders arrested more than 1,000 people. Curfew was imposed, the penalty for possession of weapons was death, and the standing orders were that Bolsheviks were to be denounced.

The Entente diplomats spread the specious assurance that these actions were temporary and non-political. In an interview printed in the Sfatul ţărei newspaper on December 25, 1917, the self-styled French Consul in Kishinev P. Sarré, anticipating the invasion, said he "guaranteed" that the foreign troops would not imperil the freedoms won by the revolution and would in general withdraw as soon as Moldavian troops could take over. A month later the same newspaper published a telegram from the French envoy in Jassy A. Saint-Oléra: "All my colleagues, the Ambassadors of the Allied powers, and I personally are authorised to tell you officially that the entry of Rumanian troops into Bessarabia is a purely military measure aimed

at safeguarding the normal functioning of the rear of the Rumanian Russain front."[13]

Although Bessarabia's transfer to Rumania had been planned in the Western capitals long before the October Revolution,[14] in January 1918 the imperialists were still reckoning with their whiteguard clients and did not hurry to sanction the seizure openly. But the objectives of the Entente (to build up an anti-Soviet springboard in Bessarabia), the rulers of Rumania (to seize that territory) and the Sfatul ţărei (to strangle the socialist revolution there) coincided. The actions of the Western diplomats in Jassy facilitated the occupation, playing into the hands of the Rumanian oligarchy.

Two weeks after the commencement of the invasion, the Sfatul ţărei ringleaders, prompted by Jassy, "seceded from Russia", and made haste to inform the Entente and the USA of this act.

During this period the Soviet forces were successfully advancing in the Ukraine. On February 8, 1918, under their onslaught, the bourgeois Central Rada fled from Kiev. Lenin ordered the troops that had liberated the city to "act as energetically as possible on the Rumanian front".[15] A special army under A. Yegorov utterly routed a Rumanian division that attempted to cross the Dniester at Rybnitsa. After a four-hour battle the revolutionary forces occupied the town.

The resistance of the population of Bessarabia and the blows dealt the interventionists by the Red Army were the factor compelling the Rumanian Government to take steps to settle the conflict. There were also other motivations for this, in particular the desire to obtain the release of the Rumanian political and military leaders arrested by the Soviet authorities in Odessa at the outset of the invasion. The Entente representatives hoped that these negotiations would wreck the Soviet Republic's talks with the Central Powers.

* * *

A large number of Rumanian émigres found their way to the south of Russia during the world war. Some Rumanian industrial enterprises were evacuated to that area. In the Ukraine there were nearly 25,000 Rumanian workers, soldiers and sailors. Moreover, there were many people who belonged to the "other", bourgeois-landowner Rumania—officers, quartermasters, and members of parliament with their families (three schools were opened for their children).

The socialist revolution in Russia made the members of the Rumanian colony go to different sides of the barricades. We have already mentioned the Rumanian internationalist revolutionaries who fought in Bessarabia. They regarded the October Revolution not only as their vital cause but also as the signal for the start of proletarian battles in their own country. In early January there were mutinies in the Rumanian ships at Novaya Kiliya, Ismail and Vilkov. In Odessa Rumanian revolutionaries took part in the battles against the forces of the bourgeois Central Rada that ended with the establishment of

Soviet power in the city. Two Rumanian battalions—land and marine—the first of the many internationalist units that fought in the Civil War in Russia, were formed in Bessarabia when that territory was invaded by Rumanian troops. On January 26, the Rumanian revolutionaries, aided by the crews, seized the Rumanian ships lying in the port of Odessa. In this action they took prisoner a large group of Rumanian members of parliament. The Rumanian Revolutionary Committee functioned as the embryo of the new power and was recognised by all Soviet organisations. It had its own armed forces, conducted broad agitation among Rumanian nationals, and arrested counter-revolutionaries. A Rumanian battalion took over the Rumanian Consulate, offices and warehouses.

On January 24, 1918, the Soviet authorities in Odessa demanded that the Rumanian Government immediately evacuate all its troops from the territory seized by them in the Russian Federative Republic. On the day previous to making this demand they had requested the French, British and Rumanian consulates to expedite the evacuation of the Rumanian troops. In reply the Entente diplomats hypocritically declared: "The conference of consuls expresses its deep regret that some public circles are trying to use the unfortunate misunderstanding in some places in Bessarabia, where small Rumanian units were sent to protect Rumanian state shops, as an excuse for provoking war between two Allied nations."[16] The Rumanian Consul in Odessa replied in the same vein: "I can assure you that I have no official knowledge, I repeat, of any Rumanian entry into Bessarabia. I cannot trust newspaper telegrams."[17]

The Soviet authorities had to explain to the Entente diplomats that the "invasion and attack by the Rumanian troops are not a misunderstanding but a deplorable deliberate political action".[18] The consuls forwarded the demand for the evacuation of the interventionist forces from Bessarabia to the Allied missions in Jassy. The accompanying statement was signed by representatives of Greece, the USA, Serbia, France, Britain and Italy. On February 9 the doyen of the diplomatic corps in Rumania, the Italian envoy Fashiotti sent a radio message to Odessa stating that the Rumanian Government was prepared to enter into negotiations.

This convincingly showed that the Entente diplomats not only knew of but were directly involved in the contacts that were established between the Soviet authorities and the Rumanian Government on February 8, 1918.

The Entente representatives who acted as mediators set the record in hypocrisy when they assured the Soviet authorities of their goodwill. Colonel Arquier, Head of the French Military Mission in Odessa, announced that General Berthelot had ordered that no member of the French armed forces should take part in the hostilities against Russians whatever their party affiliation. He assured the Soviet authorities that the commission (in which there were two French officers) sent to Jassy would insist that the Rumanians immediately end the shooting and arrests of Russian citizens.

Members of the Supreme Autonomous Collegium for Russo-Rumanian Affairs (organised by the Council of People's Commissars of the RSFSR to settle the conflict with Rumania) arrived in Odessa at the close of January and took over the direction of the negotiations. Showing its readiness to reach agreement on a principled and acceptable basis, the Collegium accepted the proposal of the British Colonel Boyle and the French Colonel Arquier for the formation of a mixed commission to settle the conflict. This proposal was reaffirmed by a telegram from Fashiotti on February 21, 1918, to the consuls of nine powers in Odessa, in which he assured them that the operations of the Rumanian troops had the full agreement of the Allies and the Bessarabian authorities and were not of a political character. The Fashiotti telegram embarrassed some of his colleagues in Odessa who had denied the Entente's complicity in the seizure of Bessarabia. But his assurance that the invaders were not pursuing political objectives opened the door for negotiations. The Supreme Autonomous Collegium elaborated the conditions of agreement which was sent to Jassy. A Protocol on the settlement of the Russo-Rumanian conflict and a Russo-Rumanian agreement on the evacuation of Rumanian forces from Bessarabia were signed in Odessa and Jassy on March 5 and 9 respectively.

In the agreement Rumania unequivocally pledged to withdraw from Bessarabia in the course of two months, to refrain from military, hostile or other acts against the RSFSR and to give no support to such acts by other states. The terms were so worded as to give the Rumanian oligarchy no possibility of referring to some textual-legal catch and thereby wrecking the agreement. The right to leave a large force in Bessarabia to protect warehouses and railways was reserved to Rumania. However, this deprived it of a formal pretext for interfering in Bessarabia's affairs. Moreover, the Soviet authorities provided to ship to Rumania any surplus grain in Bessarabia and accorded her the right to purchase other foodstuffs in Russia. In the event the Rumanian army was forced to retreat it would be given right of asylum on Soviet territory. In view of the fact that Austrian and German troops had invaded the Ukraine, the Soviet authorities allowed for the possibility of parallel actions against the Central Powers and their allies. Provision was also made for an exchange of interned and arrested citizens of both countries.

The signing of these agreements was a major achievement of the emerging Soviet diplomacy. On March 19 the Chief-of-Staff of the revolutionary units of the Rumanian front informed the Council of People's Commissars that hostilities had ceased. On March 21 the Rumanian Consul in Moscow inquired at the People's Commissariat for Foreign Affairs whether his consulate could resume functioning in connection with the settlement of the conflict between the two countries. A few days later *Izvestia* reported that a settlement had been achieved.

However, with the complicity of the Entente and the Central Powers, the Rumanian oligarchy violated the agreements signed in Odessa and Jassy.

* * *

The Entente's mediation in the Russo-Rumanian talks and the assurances of "friendly feeling" made by its representatives were part of a general anti-Soviet manoeuvre by international reaction. When the negotiations at Brest were at a crucial stage, the Entente powers and the USA began to cherish the hope that the Bolsheviks would be compelled to continue the war against Germany. In London, Paris and Washington it was stated officially and unofficially that it might be possible to help Soviet Russia. At the same time, the actions of the Entente representatives in Jassy and Odessa pursued special aims. After having put down Soviet power in Bessarabia with the help of Rumanian bayonets, they now feared that the invaders would be crushed and sought to secure a respite for them. This was the other source of their shortlived "peaceableness". Lastly, the Entente feared that large Rumanian forces would be diverted to the East, for it did not desire the armistice on the Rumanian-German front to turn into peace.

As regards Germany and her allies, they connived at the invasion of Bessarabia. Fieldmarshal Mackenzen's Headquarters closely followed the transfer of the most combat-worthy units of the Rumanian army to Bessarabia, closing its eyes to the fact that this was a breach of the Focsani armistice terms. Moreover, an additional convention on the armistice at sea, giving Rumania freedom of action on the high seas, was signed in Brăila on January 27, 1918.

These actions of the Central Powers connived at the Entente invasion of Bessarabia. In Berlin and Vienna it was calculated that the Entente would have to pay for the possibility of seizing Bessarabia with onerous peace terms. Brătianu, who headed the Rumanian Government that started the invasion of Bessarabia, told the Rumanian envoy in Paris V. Antonescu: "Our battles against the Maximalists [meaning the Bolsheviks. — *V. V.*] are making it impossible for the army to repulse a German advance if the armistice is violated."[19] In Jassy they apprehensively waited for Germany to present the bill for Bessarabia. On January 25, in a note worded in the form of an ultimatum, Fieldmarshal Mackenzen gave Rumania four days in which to declare whether she intended to begin peace talks.

In connection with this note, the Entente representatives expressed the confidence that Rumania would continue the war and that she would not separate her destiny from that of the Allies. In order to soften the attitude of his Entente partners, Brătianu lauded the services of the Rumanian oligarchy in the struggle against Soviet power and said they should consider that Rumania had fulfilled her duty even if she signed a separate peace with the Central Powers. But the Rumanian Government did not get the sanction for such a step. The Rumanian reactionaries had to surrender without receiving any insurance against the event of an Entente victory. The invasion of the Ukraine by Austrian and German forces put an end to their vacillations. It was regarded with relief rather than anxiety: the unpleasant "contact" with the Soviet armed forces would cease; the Germans did

not object to the seizure of Bessarabia; and the old variant of cooperation in the joint plunder of Russia came to the surface. The Germans and their allies gave the governments of A.Averescu and then of A.Marghiloman the most unambiguous assurances on this score. While negotiating with the Soviet authorities, the Averescu government agreed to the passage of Austrian and German troops across Bessarabia. Three Austro-German corps advanced along that route towards Kiev and Odessa.

Although the Central Powers imposed the predatory Bucharest Peace Treaty of May 7, 1918, on Rumania, they did not go back on their promises regarding Bessarabia. On the contrary, at the most difficult moments the reminder that Rumania could hold on to the territory she had seized helped Germany and Austria-Hungary to obtain further concessions from Rumania.

The Bucharest Peace Treaty prescribed a sharp reduction of the Rumanian army's strength—to 32,200 effectives. But this referred only to the territory of the "Old Kingdom". In Bessarabia the invaders could maintain four fully complemented divisions. This state of affairs was to continue until "as a result of the military operations of the Allies [Central Powers.—*V.V.*] in the Ukraine the threat to Rumania's frontiers is lifted".[20] Translated from diplomatic language, this meant that Germany and Austria-Hungary guaranteed Rumania the possession of Bessarabia. For this the Rumanian Prime Minister pledged to supply the Central Powers with 12,500 carriage-loads of Bessarabian grain. By May 1918 this grain had been requisitioned and shipped.

Upon his return to Jassy Marghiloman summoned Inkulets, Chuguryan and Khalippa who had been awaiting the decision on the destiny of the "Moldavian Republic". The farce of "unification" with bourgeois-landowner Rumania that was to be enacted with the Sfatul ţărei, with the Bessarabian population as the pawn, had been agreed on at a private meeting and then at a sitting of the Rumanian Government. The Entente, for its part, was increasingly crystallising its plans for Russia's fragmentation; Rumania's rulers were thus moving with and not against the current. The Entente's attitude gave them a free hand to formalise their seizure of Bessarabia.

Stere was sent to help the Sfatul ţărei ringleaders with the status of a deputy of that select and corrupt organisation, many of whose members knew nothing of the backstage deals of their ringleaders. Even after the invasion had begun Inkulets and Erkhan categorically denied that they had invited the Rumanian forces. They circulated the Entente statement that the action was purely military and temporary. The members of the peasant faction, who were known as opponents of the "unification", were subjected to "persuasion" for three days. They had before them the example of Rudyev and other leaders, who had been shot for resisting or simply opposing the invaders. The Kishinev Siguranza (secret police), whose torture-chambers were in the cellars of a theological seminary, prepared for the "great act" in its own way.

Nevertheless, the operation set for April 9 in the Sfatul ţărei did not go smoothly. Hour after hour passed, but the Rumanian Prime Minister Marghiloman, who had come to Kishinev specially for the purpose, did not receive an invitation to the conference hall. In the Sfatul ţărei residence, surrounded by a Rumanian "guards of honour" and in the presence of Rumanian gendarmes, Inkulets, Erkhan and Stere "convinced" their opponents. Despite the rules, they insisted on a show of hands. But even in this situation 62 members of the Sfatul ţărei refused to take part in the farce; 86 members voted for Bessarabia's incorporation in Rumania as a territory with certain autonomous rights. After he had waited for seven fatiguing hours, Marghiloman finally received the possibility of entering the conference hall and reading King Ferdinand's message of welcome to his new "subjects". The newspapers reported that Marghiloman had donated 100,000 lei to charity. The Rumanian treasury, exhausted by the war, dislocation and famine, was empty at the time. But it was worth throwing a couple of pieces of silver for philanthropy: much grain had accumulated in Bessarabia, and the Russian army had huge arms depots there; the territory was still far from the exhaustion that was felt in Rumania.

The fact that the invaders wasted no time in plundering the territory is shown eloquently by the secret communication sent to the Rumanian Government in December 1918 by Khalippa, Codreanu and some other Sfatul ţărei leaders. In the autumn of 1918 Bessarabia was reduced to the starvation level in Rumania. The Rumanian oligarchy felt that it was time to go over to political unification and abolish the territory's paper autonomy. General A. Văitoianu set about this task with military determination and barrack-room high-handedness. By that time many of the Sfatul ţărei members had fled. But the general deported those among the remainder whom he regarded as "suspicious". He summoned the others and told them that they had to renounce autonomy, threatening that any vacillation would be punished. As a result, on the appointed day (December 8) there was a shortage of "deputies". Many did not even suspect why they had been invited to the sitting. However, after they read the agenda they felt it was prudent to walk out. On the next day the Sfatul ţărei mouthpiece warned that the deputies who would fail to attend the next sitting would be declared "Russian agents". But even this threat failed to muster a quorum on December 10. The Sfatul ţărei ringleaders had to co-opt 17 of their supporters from the public. The act on the renunciation of autonomy received 36 votes. Less than one-forth of the Sfatul ţărei deputies voted for "unification". The voting was thus unlawful even procedurally, to say nothing of the fact that the self-appointed organ had no legal foundation for existing as a popular assembly.

Thus, in 1918 Rumania seized Bessarabia with the participation of two belligerent imperialist groups and with the support of Whiteguard nationalist dregs of the most diverse hues: the supporter of an "undivided and indivisible Russia" Shcherbachov, the Ukrainian bourgeois Central Rada and the Moldavian bourgeois nationalists.

The occupation lasted 22 years. The people went on resisting and the communist underground continued the struggle throughout all these years. The population of Bessarabia felt the firm support of the Soviet Motherland. After the notorious "voting" of April 9, 1918, the People's Commissariat for Foreign Affairs of the RSFSR lodged a strong protest with the Rumanian Government against the seizure of Bessarabia, assessing this action as a challenge to the Russian Federative Soviet Republic, a flagrant breach of the agreement on a Rumanian withdrawal from that territory and brute force against the Bessarabian population, which had unanimously and openly protested against the Rumanian occupation. This remained the guideline of the CPSU and the Soviet Government until the historic day of June 28, 1940, when the people of Bessarabia welcomed their liberators, units of the Red Army, with flowers.

NOTES

[1] *Pravda*, October 12, 1974.

[2] See *Struggle of the Working People of Bessarabia for Liberation and Reunification with the Soviet Motherland, 1918-1940*, Kishinev, 1970, p.11 (in Russian). This collective work contains a detailed bibliography of works on the subject.

[3] See *Desbaterile adunării deputaţilor. Sesiunea ordinară 1917-1918*, Jassy, 1918, p. 132.

[4] Some of these documents were cited at a sitting of the Rumanian parliament on June 12, 1918. See *Desbaterile adunării deputatilor. Sesiunea ordinqră 1917-1918*, pp.109-110.

[5] See S.Brysyakin, M.Sytnik, *Triumph of Historical Truth*, Kishinev, 1969, p.15 (in Russian).

[6] *Documents on Soviet Foreign Policy*, Vol. 1, Moscow, 1957, p.66 (in Russian).

[7] D. Antonyuk *et al.*, *The Treacherous Role of the Sfatul ţării*, Kishinev, 1969, p. 127 (in Russian).

[8] K. Slutskaya, *The Victory of the October Revolution and the Establishment of Soviet Power in Moldavia*, Kishinev, 1962,p.207 (in Russian).

[9] D. Antonyuk *et al.*, op. cit., p. 155.

[10] Ibid., p.152.

[11] *Pages From the History of the Moldavian Komsomol*, Kishinev, 1966, p.49 (in Russian).

[12] *The Struggle of the Moldavian Working People Against the Interventionists and Internal Counter-Revolution in 1917-1920*, Kishinev, 1967, p. 79 (in Russian).

[13] *History of Diplomacy*, Vol. II, Moscow, 1945, p. 354 (in Russian).

[14] Edward House, *The Papers of Colonel House*, Vol. 3, Moscow, 1939, p. 37 (in Russian).

[15] V. I. Lenin, *Collected Works*, Moscow, Vol.36, p.476.

[16] *The Struggle of the Moldavian Working People Against the Interventionists and Internal Counter-Revolution*, p. 61.

[17] Ibid., p.60.

[18] Ibid., pp.66-67.

[19] *Studii şi materiale de istorie contemporana*, Vol. 1, Bucharest, 1956, p. 13.

[20] F. Notovich, *The Bucharest Peace of 1918*, Moscow, 1959, p. 212 (in Russian).

Artificial Intelligence

OLEG TIKHOMIROV

Cybernetics, which Norbert Wiener regarded as a theory of control and connection in animals and machines, has ramified in the course of its development into a number of fields designated as "self-organising systems", "simulation" of human thinking and "artificial intelligence". The third line has now become the leading one. It has been developed in the USA, where the following research centres have figured prominently: the Marvin Minsky group at the Massachusetts Institute of Technology; the Stanford project directed by Professor John McCarthy at the Stanford Research Institute; and a group led by H. Simon and A. Newell at the Carnegie-Mellon University. Intensive research is also being carried on at the University of Edinburgh in Britain and at the University of Uppsala in Sweden. Research is under way in Japan. An "artificial intelligence" association which coordinates research on a world scale holds international conferences twice a year. The Fourth International Joint Conference on Artificial Intelligence was held in Tbilisi in 1975. An international journal *Artificial Intelligence* was started in English in 1970.

Intensive research in this field is also being carried on in the USSR under the Council on the Problem of Artificial Intelligence set up by the Systems Analysis Committee under the Presidium of the USSR Academy of Sciences (Chairman G. Pospelov, Corresponding Member of the USSR Academy of Sciences) and a corresponding section of the Scientific Council on the Complex Problem of Cybernetics under the Presidium of the USSR Academy of Sciences.

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The problem of artificial intelligence was dealt with by the 7th All-Union Symposium on Cybernetics, which was held in Tbilisi in June 1974. Cooperation with foreign scientists is envisaged within the framework of the International Institute for Applied Systems Analysis in Vienna. Let us note, at the same time, that it is still debatable whether the term "artificial intelligence" should itself be used.

We feel that the first thing to do is to bring out the real problems being tackled in this field, to establish its connections with other fields of knowledge, and to consider the theoretical interpretations of the practical achievements and difficulties. The comparison between the human intellect and the functioning of the machine, the establishment of the similarities and distinctions between them amount to an important approach to the analysis of "artificial intelligence" as a field of research. Within the framework of this approach it is necessary, we feel, to use the data provided by psychological science in which the human intellect is traditionally one of the main spheres of research. Scientists working in the field of artificial intelligence have set themselves the practical goal of developing a machine capable of performing actions for which the human intellect is normally required. Let us emphasise, in particular, that it is the human intellect that is here dealt with and that, consequently, an analysis of the behaviour of animals, of the functional organisation of the behavioural act [1] cannot provide adequate ground for assessing the line of research being discussed.

The field of research which has been designated as "artificial intelligence" has yet to take final shape, and there is not yet complete clarity concerning the content of research in this field. According to Nils J. Nilsson, this includes "automatic methods for solving problems, 'understanding' and translating languages, proving theorems, and recognising speech and visual objects",[2] while James R. Slagle lists "artificial networks, artificial evolution and heuristic programming".[3]

The analysis of the theoretical principles of "artificial intelligence" as a line of research is of fundamental importance. Some writers merely list the theoretical disciplines which need to be studied by those who choose "artificial intelligence" as their specialty: mathematical logic, structural linguistics, the theory of calculations, the theory of information structures, the theory of control, the statistical theory of classification, the theory of graphs, and the theory of the heuristic approach. What is characteristic here is that neither psychology in general nor the psychology of thinking in particular, nor even philosophy are usually listed by Western and Japanese scientists among the theoretical disciplines on which research into "artificial intelligence" is based.

The term "artificial intelligence" is also frequently used to designate the functional potentialities of the machine: it is "intelligent" if it solves "human problems". But there are different views of the criterion to be used in judging the existence of artificial intelligence. Some believe that it has already been created and that the

only problem is to improve it. One indicator of the intelligence of the machine that is believed to be convincing is the possibility of playing games like chess and chequers. (Let us note that it is generally recognised that the strongest chess programme has been developed in the USSR.) This criterion for the existence of artificial intelligence is sometimes also used in Soviet writings. Thus, according to G. Smolyan, "machine intelligence fully... deserves to be classified as creative".[4] Psychology is in possession of data showing that the same problems can be tackled by man and machine with the use of different principles, and that the similarity of the formal results (recorded or printed) alienated from the solving system cannot serve as ground for "diagnosing" the existence of human intelligence in the machine.[5]

Other scientists believe that "artificial intelligence" will be developed in the future. They say that "artificial intelligence is realised only if an inanimate machine can solve problems that have, thus far, resisted solution by man; not because of the machine's sheer speed and accuracy, but because it can discover for itself new techniques for solving the problem at hand".[6]

THEORY OF HEURISTIC SEARCH AND THE PSYCHOLOGY OF INTELLIGENCE

One may be left with the impression that the theory of the heuristic search is simply another name for the psychology of intelligence, but that is not so. There are important distinctions not to be ignored between the heuristic search, which is considered in the theory of "artificial intelligence", and the activity of human intelligence.[7]

The first distinction is that in works on artificial intelligence the so-called heuristic search usually bears on problems in which there is a precisely defined initial situation and a precisely defined goal, whereas what is characteristic of man is his shaping of purpose and identification of the initial and subsequent situations of search. It is generally recognised that research into artificial intelligence has yet to formulate a universal method for finding artificial formulations of problems.

The second distinction is connected with the nature of the "operators" which transform one situation into another. In man's intellectual activity this "transformation" may have a qualitatively distinct psychological structure, being effected by purposeful action, impulsive action or ingrained habit. There is also a substantial distinction between the two types of "operators": practical behavioural acts (approach or retirement, manipulation, etc.) and gnostic or investigatory acts (inspection, observation of relations in a situation, identification of its properties before effecting practical acts). "Operators" of the second type are usually ignored in works on artificial intelligence.

The third distinction relates to "states". When describing "states", man makes use not only of forms like symbol lines, vectors, two-dimensional arrays and lists, but also images, significance and

meaning, whose main feature is that they are related to objects. Alongside the spatial aspect of the "states" of the problem, man also needs to consider the space of his own states as the subject tackling the problem, and this is not irrelevant to activity in solving the problem.

The fourth distinction is that the so-called heuristic methods of search in natural intelligence are of a different nature than those in artificial intelligence. For man, acceleration of search depends not only on the specific information about the problem, but also on the subjective factors which help find the solution, the motivations for his activity, his mental state, his aim, etc. It is not only and not so much the syntactical or semantic rules regulating his search as the factors of meaning that are characteristic for man. In man's intellectual activity it is not simply the use of his functions of appraisal but their formation in the course of the solution of the problem that occurs. These functions of appraisal may also be qualitatively distinct (emotional and verbal assessments, generalised and situational).

This list already shows that psychological science has to consider a much broader range of problems than the so-called theory of heuristic search. Let us also note the highly arbitrary interpretation of "limited processing" as being heuristic (in the sense of "serving to discover") because by "discovery" here is meant the solution of any problem in a way that is shorter than full-range processing. Among the factors which in man's intellectual activity actually "serve to discover", the most important ones are as a rule not mentioned, such as the state of utmost concentration of mental activity, which is called inspiration.

These distinctions are essential for an assessment of the works on "artificial intelligence". They show that the improvement of heuristic search in "artificial intelligence" *may not be accompanied* by any essential approximation to the structure of human intelligence.

PROSPECTS FOR IMPROVING "ARTIFICIAL INTELLIGENCE"

"Artificial intelligence" is a rapidly developing field, which is why the prognostication of its development and the assessment of its validity are of great importance. Psychology has also made some contribution to the solution of these problems.

Initially, in the theory of programming problems for computers there was a distinction and even an antithesis between two lines of research: "artificial intelligence" and simulation of mental processes. The former implies the programming of problems for computers regardless of how these can be tackled by man, and the latter, programming with an attempt to reproduce in machine programmes human modes of solution. This distinction has now virtually disappeared. The orientation of "artificial intelligence" as a scientific field is now different from what it used to be some eight or ten years ago: the approximation of machine modes of problem solution to human modes is formulated as the strategic goal in the field of artificial intelligence.

In the search for ways to achieve this goal, many writers have turned to a comparison of human intelligence and the potentialities of the computer. However, many such comparisons are obviously one-sided. The most widespread is the view of man from "the position of the machine" ("machinocentrism"), which means that the characteristics brought out in man are chiefly those which we find in the machine, whereupon there is a consideration only of the extent to which they are manifested in man. For instance, there is a consideration of "speed", "memory capacity", "efficiency at arithmetics", and "speed and accuracy with which information can be stored". This approach tends to ignore the group of "human characteristics", which are altogether inapplicable to the machine: need, motivation, purpose, and emotional regulation of activity.

As a result of an extremely short list of distinctions, the very bold conclusion is drawn that "none of the differences... are insuperable"[8] on the way to approximating the potentialities of the machine to human intelligence. The conclusion is then drawn that there are very real possibilities for developing a machine which is more intelligent than man himself, and the claim is finally made that if we are able to build a machine which is more intelligent than we are, it will be able, for its part, to develop a machine even more intelligent than itself.

There is a need for a complete consideration of the specific features of human intellectual activity even for a more precise assessment of "machine" characteristics. Thus, for instance, there is need to limit the constantly argued advantages of the machine in terms of "high-speed operation", which unquestionably applies only to "routine" operations, but is altogether irrelevant to creative activity, that is, one which includes the formation of purpose or design, something the machine cannot perform at all.

But even when scientists emphasise the machine's advantages over man, they tend to consider human intelligence one-sidedly. Thus, there is frequent mention of the "volume of parallel information processing" as man's unquestionable advantage, but what is ignored is the highly important property of human activity as the ability to realise this through qualitatively different and not merely parallel processes. An example is provided by the interaction of the conscious and unconscious components in the structure of man's intellectual activity. Some have altogether confined themselves to purely quantitative characteristics, on the plea that, as compared with the machine, the brain contains many more computing elements which have a vast number of links with each other.

The distinctions between human and machine errors are also mentioned in listing man's "advantages": while machine errors may amount to "complete nonsense", "the brain does not break down completely and... the result is almost never complete nonsense" (N. S. Sutherland). However, this important statement is confined only to a characteristic of the "output", behind which lies a specific feature of human activity that is of fundamental importance, namely, comprehension, which is inherent in memory, in reproduction and in the organisation of the search for solutions to the problem itself.

Now and again, mention is made of features of human activity like "selection of essential data", "extraction of essential information", without any indication, however, that the "essential" nature of the information for man is determined by its relevance to his requirements, which may change in the course of the solution of a concrete problem. Some researchers, while not denying the obvious fact that the organism has requirements, hold them to be something extraneous to the organisation of behaviour itself. But in psychology, requirements are regarded as being the most essential components of man's intellectual activity. Experimental research has shown that requirements are connected not only with the formulation of the ultimate goal, but also with the solution of the problem and the organisation of the search itself.

Among the meaningful programmes for improving artificial intelligence three may be identified.

Under the first, an increase in memory capacity and internal links between its elements is to advance the creative capacities of the machine. There is every reason to take a critical view of this opinion, because there have been instances in which an increase in the memory capacity and internal links between its elements in man has not at all resulted in a growth of creative capabilities.[9]

The second programme sets as the key task the need to bring out a system of conceptions or knowledge used by man in solving a given class of problems, and their insertion into the machine programme (transfer of "semantic information"). In this context, knowledge is taken to mean a capacity to answer questions. A system that replies to questions has knowledge. This is the so-called empirical definition of knowledge. The mode for bringing out the knowledge required by man in solving a given class of problems usually used by artificial-intelligence specialists consists in self-observation in the process of learning.

To assess this programme there is need to take account of the facts that psychology has long since drawn a distinction between formal and intelligent knowledge. Where a student has advance knowledge of the questions he will be asked at an examination and "mechanically" memorises the answers, the good teacher will rarely take pride in his success. Mechanical memorising leads to the establishment of external links between questions and answers (and it is quite another matter to say that this phenomenon does not occur in pure form in practice). But whenever information is established intelligently, it is always incorporated in the system of man's past experience. The principle of intelligent learning is one of the basic principles of didactics. The non-mechanical nature of the assimilation of social experience is due, in particular, to the contradictory nature of the information which the child faces, and the need, first, to make preferences and then a conscious selection of the established knowledge. Within the framework of "artificial intelligence" knowledge is treated formalistically and has no more than an outward similarity with true human knowledge.

The mode used by artificial-intelligence specialists to bring out human knowledge (through observation of the process of learning) as used in the solution of problems is extremely limited. The point is that in every human action there are conscious and unconscious components, including generalisations. It is common knowledge that experimental action with objects helps man to form practical generalisations which he does not altogether consciously realise but which take an active part in the solution of a given class of problems. Without an identification of these generalisations, no answer to the question of which knowledge is used by man in solving a given class of problems will be substantially complete, but this can be done only through an objective analysis of activity with the use of special experimental sets of methods.

This is further compounded by the fact that when solving problems man not only applies old, but also works out new knowledge. Just as biological heredity does not abolish plasticity of behaviour even among insects, so also "social heredity" does not abolish the individual's independent creative activity, although it does modify it.

The third programme for improving artificial intelligence brings to the fore the simulation of human "heuristics", but in so doing it ignores the distinctions between machine and human heuristic methods, which were dealt with above.

Thus, it is possible to bring out a highly essential feature of "artificial intelligence" as a scientific field: *the strategic goal—to approximate to human intelligence—is posed in such conditions when the use of the data provided by psychological science on human intelligence is either ignored or restricted in use.*

A psychological analysis of the relation between natural and artificial intelligence warrants the assertion that all these three programmes for improving artificial intelligence imply a change in characteristics which in human intelligence should be qualified as an "external quantity" (increase of memory capacity and links between its elements, increase in the volume of formal knowledge, increase in formal methods of reducing search). If in this totally real situation, the strategic goal of "artificial intelligence" as a scientific line—the reproduction of human modes of intellectual activity—is to remain meaningful, there is need to formulate another, fourth programme for improving artificial intelligence, namely, a programme that would contain an attempt to simulate the requirements, the emotional regulation of search, purpose formation, and selective reflection of the situation.

The frequently formulated proposition that there are now no theoretical limits to the extent of intelligence that machines may acquire at some future time requires one essential corrective: if there is to be a fourth programme for improving artificial intelligence, what should now be discussed is not the question of whether there are or are not limits to realising the programme, but the question of whether it can be started at all, that is, the possibility of simulating the internal

essential properties of human intelligence in the operation of an automaton.

Projections of improvements in artificial intelligence frequently bear on the question of whether there is or is not a line between natural and artificial intelligence which cannot be "transcended in principle". Here there is need to take account of experience in formulating similar scientific problems: although there are no limits to the *application*, say, of the laws of mechanics to the operation of the living organism, there are limits to their use to express the *specifics* of the organism.

The "emancipation" of research into artificial intelligence from the psychology of intelligence, which has been brought out in the course of comparative analysis, does not set limits to progress in improving computing techniques and their mathematical back-up, but does set very essential limits to the possible interpretations of the practical results obtained in their relation to the human intellect.

"ARTIFICIAL INTELLIGENCE" AND MATERIALISM

"Artificial intelligence" is not always regarded merely as an "engineering discipline". The question of the relation between natural and artificial intelligence has been discussed by many scientists in the context of ideological problems, with some of them seeking to link up the identification of natural and artificial intelligence with the materialist world outlook. Thus, the US artificial-intelligence specialist H. Borks, considering the traditional question of "Do computers think?", claims that "a positive answer presupposes a materialistic and pragmatic view of the universe, ...whereas a negative response must be based upon a form of philosophical dualism".[10] The assumption is that the development of artificial intelligence will shed light on the "eternal problem of the relationship between the soul and the body", and "man's role in the universe". According to James Slagle, the existence of artificial intelligence would support the "mechanistic conception", which regards man as no more than a machine, while the answer to the psychophysical problem will be this: only the body exists.[11] The psychologist Ulric Neisser also believes that the analogy between man and computer is based on materialism.[12] Thus, many researchers into artificial intelligence declare their ideological attitude to be *materialistic*. But the fact is that the theorists of artificial intelligence either say nothing at all about *dialectical materialism* or declare it to be "obsolete". I, personally, have encountered this approach at many international conferences and congresses.

Some Soviet scientists have also connected the problem of artificial intelligence with the basic question of philosophy. Thus, I. Poletayev, declaring that thinking machines can be developed, says that this is based "on the professional philosophy of any engineer and scientist (whether he goes to church or not), on the confidence that matter is primary and that the notorious 'spirit' is an attribute of

matter and of matter alone".[13] The author says that the first period in the use of computers was one of "actual consolidation of the philosophical positions of materialist monism", which he sees as a denial of the biological or social specifics that are "irreducible to the lower forms of motion".[14]

In this context, it is of fundamental importance to clarify the kind of materialism being backed by the enthusiasts of developing artificial intelligence, and the kind of professional philosophy and monism they have in mind. Materialism, like "professional philosophy" and "monism" seen in this light, is quite obviously not dialectical materialism, one of whose central propositions is the assertion that the various forms of the motion of matter are qualitatively specific, so that "anti-reductionism" is, in consequence, one of its characteristic features.

Everyone knows that there are different forms of materialism (and also of idealism). The adjectives "mechanistic", "metaphysical" and "vulgar", whose meanings partially overlap, are usually used to characterise pre-Marxian materialism. Some forms of materialism are described as "natural-scientific materialism". "Mechanicism" has two meanings, one particular and one more general. The particular meaning applies to that form of materialism which was connected with classical mechanics, and the more general one to any method of "reducing" complex phenomena to their more simple components. Indeed, *the notion of man's being "no more than a machine" constitutes the basis of the peculiar form of natural-scientific materialism, which is being developed by the scientific line of "artificial intelligence"*. This materialism is mechanistic in the broad sense considered above, but it is also a new form of mechanicism, because the main thing here is not the laws of mechanics but the laws of "information processing".

In other words, there is a change in the concrete forms of mechanicism, while it is retained as a principle. The "machine or soul" alternative must be resolutely rejected because it contradicts the substance of dialectics. Neither "machine", nor "soul" but mentality as a qualitatively peculiar phenomenon which arises at a definite stage in the development of matter and which has new properties in comparison with matter which has not yet gone through such development.[15]

Some philosophical propositions being put forward in the context of "artificial intelligence" research may be taken to mean that intelligence "disappears" as a specifically human formation. In effect, the content of "artificial intelligence" research consists above all in the theory of programming, taken in the broad sense to mean the logico-mathematical "back-up" of the machine. Now and again the theory of the machine itself is included. The name "artificial intelligence" is no more than a metaphor, like "artificial hand" or "artificial eye" as applied to mechanical manipulators and monitoring telecameras. However, if the distinction between the natural and the artificial hand or between the natural and the artificial eye are fairly obvious and do not generate long discussions, the distinction between

natural and artificial intelligence are not so obvious for many, and are now and again deliberately minimised. The result is that the metaphor is literalised. In these circumstances there arises the question of whether it is advisable to continue using the term "artificial intelligence", a suggestion which should not be seen as playing down the practical successes in this field.

"ARTIFICIAL INTELLIGENCE" AND THEORETICAL PROBLEMS OF PSYCHOLOGY

The emergence of a special scientific field connected with the development of artificial intelligence has led to the formation of new interdisciplinary links which need to be analysed. While this scientific line has tended to ignore or to make very limited use of psychological data concerning human intelligence, psychological science, by contrast, has now come under very strong influence from the "artificial intelligence" field.

The development of psychological theory has always been and, quite naturally, still is under the influence of the philosophical school, either materialist or idealist. For a long time metaphysical, mechanistic materialism was the only alternative to idealism. In psychology, this antithesis of the two philosophical lines has assumed the form of contrast between the approach to the living organism (and man) as to a machine, an automaton, on the one hand, and the idealistic interpretation of mentality as recognition of the "soul" as a special substance or introspective view of the nature of cosciousness, on the other. With the dualistic approach, man is seen as a peculiar "combination" of automaton and soul.

The "automaton" approach as a principle has become the realisation of mechanistic materjalism in psychology, and has remained such despite the improvement of automatons. Descartes, for instance, saw the automaton as a machine which moves of itself.[16] The clockwork has been cited as an instance of this. Today, the dominant form of the "automaton" approach is consideration of the workings of the brain and the behaviour of living organisms, including human activity, by analogy with the workings of the computer (that is, a device for processing information), and there is a tendency to turn the analogy into an absolute.

The "machine or soul" alternative, which is being frequently formulated in present-day writings (in the most diverse versions) is nothing but an expression of the old distinction in approach to the analysis of mentality in the light of mechanistic materialism or of idealism. Such was the alternative before the emergence of Marxism, and such it remains for psychology which develops outside the framework of Marxism. Meanwhile, Marxist psychology has eliminated the alternative.

The "automaton" approach in psychology expresses a new form of the "crisis of Cartesian introspective conception of consciousness"[17],

which has yet to be overcome outside the context of the Marxist outlook, and the present-day version of the contrast between psychology which explains and which understands. Just as "Lamettrie's 'Man-Machine' seeks to overcome all the contradictions of the human spirit by eliminating it altogether,[18] some present-day scientists regard man as being no more than an electronic machine: "Rational man is like an automaton with some programmes of behaviour or information processing, if you will."[19] Consequently, one of the central tasks of this stage in the development of scientific psychology based on the principles of dialectical and historical materialism is to make a concrete study of the phenomena which had earlier been described (in distorted form) only by idealist psychology, because the old materialism simply ignored them. In any further development of the conceptual system of psychology[20] the task of relating psychological concepts and the concepts describing the operation of automatons is among the most important ones. This task is all the more pressing, considering that the operation of automatons is frequently described by means of terms which are fairly habitual for the psychologist, namely, "plan", "prediction", "decision-making", "concept-formation", "purpose", "intellect", "inner state" and even "self-awareness". A substantial flaw in the use of such terms is the absence of any differentiation between the real meaning in which the same terms have been applied to the operation of automatons and to human activity.

I cannot accept the view that "the positive solution of the problem of the machine's superiority over man in the sphere of creative thinking *does not exclude* [my italics.— *O. T.*] any possibilities of further research, while a negative solution of this problem assumes a great responsibility".[21] The point is that the idea of the "machine's superiority" entails (willy-nilly) the idea of the superiority of the language used in the theory of automatons over the philosophical and psychological conceptions used in describing human activity. Thus, it often happens that "the comparison of man and machine will be consistently proved only provided man's social nature is expressed (with this or that degree of approximation) *in cybernetic language*" [my italics.— *O. T.*][22]. But what is one to do if this "nature" defies expression in the language of the automaton?

N. Amosov lists various psychological conceptions, like "thinking", "consciousness", "faith", "duty", "conscience" and says that they are "unsuitable for simulation"[23] And it is this fact that they are "unsuitable for simulation", that they cannot be translated into the language of the automaton is frequently seen as their unquestionable shortcoming. I think that the reverse is true: the advantage of psychological conceptions is that they fix more complicated aspects of reality from which the "automaton" approach tends to abstract itself.

The point is not whether cybernetic concepts are in general "acceptable" or "unacceptable" in psychology (let us say that they are "acceptable"), but the extent to which they can help express the specifics of psychic laws and phenomena. However, the use of such

far from cybernetic concepts as "decision-making" and "self-awareness" in application to the workings of the automaton merely tends to create a semblance of natural-scientific research into phenomena which had earlier been ignored by "scientific" (mechanistic) psychology. An analysis of the available works shows that by the "self-awareness" of a mechanism is meant its ability to "describe the essential features of its own information processing if so requested", while the capability of decision-making is described as a "process that translates sensed information into selected response".[24] A closer look shows that the automaton's "self-awareness" and human consciousness simply cannot be compared. A psychological study of human consciousness helps to bring out "sensory images", "significance", "meanings" (Leontyev), "emotions", "knowledge" (Rubinstein). By contrast, the "self-awareness" of automaton amounts to no more than a system of signs.

One of the most popular terms within the framework of the "automaton" approach to man is "information". There is need to point out that this term has a different meaning from the other expressions derived from it, like "information processing", "the information process", "information search", "information impact". In contrast to some psychologists, cyberneticians are frequently well aware of this. One could accept Poletayev's view that "when cybernetics was taken up by persons of the most diverse specialties, which were frequently very far both from technology and from mathematics, the basic conceptions of cybernetics were given a highly diverse and frequently arbitrary interpretation... The concept of 'information' itself, as correspondence between one signal or sign and another signal or event, has fared worst of all".[25] I think it is imperative to draw a clear line of distinction between the cybernetic and the every-day meaning of the term "information", because attempts have been made to declare the "automaton" approach to the study of mentality as the only scientific one, so that the psychologist who makes no distinction between those two aspects unwittingly (and sometimes consciously) finds himself an ally of "anti-psychologism".

V. Glushkov is quite right when he says: "It is altogether unnecessary to require that the concept of information should always be comprehended, as is the case in the every-day usage of the term. Information is conveyed not only by the pages of a book or by human speech, but also by sunlight, the folds of a mountain range, the noise of a waterfall, the rustle of leaves, etc."[26] In any psychological analysis of human activity and animal behaviour it is very important to draw a distinction between the "information" which is received, say, by the amoeba in the form of "sunlight", which corresponds to the phenomena of excitation, and the "information" which is conveyed by "human speech", say, in the form of a narrative about events which are individually important, and which corresponds to the level of "consciousness". Incidentally, in the treatment of speech communication itself there is a fairly widespread confusion between the semiotic and psychological interpretation of "meaning". In the first instance, one confines oneself to indicating the relationship between one sign

and another, and in the second, a distinction is drawn between the relation to the object and the meaning proper, which is seen as some kind of generalisation.[27] Generalisations themselves may either be empirical or theoretical. All these distinctions, which are significant for psychologists, tend to disappear with the information approach.

"Information" terminology has virtually flooded psychological literature: neuropsychologists identify in the activity of the brain a "device for the reception, processing and storage of information", social psychologists have been writing about the "information impact" between people, while specialists in pedagogical psychology have brought out, for instance, in the scheme of mathematical capabilities the "reception of information", "processing of mathematical information", and "storage of mathematical information". But it is engineering psychology that has taken the concept of information closest to heart. It is true that in 1966 B. Lomov remarked that "engineering-psychological research should be not only engineering but also psychological",[28] but in practice engineering analysis in this sphere frequently prevails over psychological analysis.

The contradictory nature of the term "information" is most pronounced in writings on social psychology: "Information is that which effects changes in our consciousness or emotions, and which we experience either mentally or in the form of formulating and adopting decisions, or in the form of various emotions."[29] Because "information" is regarded not only as being comprehended but also as being *experienced*, it is further removed as a term from the cybernetic one.

The "information" approach has also moved into psychotherapy, which is now described as "treatment by information", while various types of therapy are regarded as "various types of feeding, processing and operation of information".[30]

It is frequently said that works on "artificial intelligence" help enrich our knowledge about human mentality, but the *conditions* under which this occurs are not usually specified. I feel that among these conditions is the very possibility of comparing human and "machine intelligence", of bringing out the general and the specific in the human intellect, notably, the differentiation of "information processing" and mental activity proper, and also formal and non-formal structures. Writings on "artificial intelligence" make one take a fresh look at the traditional problem of capabilities, and to bring out in the list of their components those which are specific and non-specific to man. For instance, in enumerating the capabilities which are most specific for the scientist, mention is sometimes made of the capacity for analysis and synthesis, something that artificial intelligence can hardly be denied. The same applies to the capability of sorting out the essential from the inessential, because on the basis of given criteria the machine does this successfully.

Of course, a study of the properties of artificial intelligence makes a contribution to our knowledge of the most general material nature of mental phenomena, bringing out those aspects which are also inherent in inorganic matter. However, now that some experience has already

been gained in this field, there is the urgent task of correlating and comparing the effectiveness of this method to those of psychology. To this day there is meaning in Rubinstein's proposition that "the basic and ultimate theoretical task of psychology is to show the specific psychological regularities".[31] The "automaton" approach in psychology, while it does help tackle some important problems, tends to lead one away from this basic and ultimate task.

Instead of mechanically borrowing conceptions and methods, psychology should work more intensively on its own problems which arise in connection with the development and use of artificial intelligence. Among these are, primarily, the analysis of the psychological consequences of computerisation[32] and a study of the consequences of the use of "mental capability amplifiers".

When considering artificial intelligence as an instrument of human activity and human intelligence amplifier, one must bear in mind that it creates only the possibilities for "amplification" and that the opposite possibility of "decay" does not disappear automatically but, on the contrary, becomes a part of reality when the use of computers is poorly organised. This instrument may differ (as a type of machine, type of programme, type of communication with the machine), and this creates qualitatively distinct variants of "amplification". One should bear in mind that human intelligence can also be highly diverse, which means that "amplification" can apply to both wisdom and stupidity, to the intelligence of the scientist and the intelligence of the astrologist. Artificial intelligence does not "amplify" all the components of human intelligence but only its "machine-like" components, which is where it finds its "allies" in the first place. Consequently, the problem is not just to "amplify" intelligence but to transform its structure.[33] "Amplification" of intelligence should be seen in the broader context of the problem of mental development. The computer frequently operates not just as an instrument of abstract intelligence, but as an instrument of real individuals, whose motives may either be socially valuable or selfish.

Greater efficiency in the use of artificial intelligence through consideration of the specific features of human creative activity is a special scientific problem. It is not only cybernetics but also psychology which constitutes the theoretical foundation for automating mental labour.

Technical writings frequently formulate the task of "matching" the characteristics of man and machine. I must emphasise that this approach is limited and that it is wrong to identify this task with that of optimising the conditions of human activity. Very frequently the conditions of activity are optimised by "dismatching" the characteristics of man and machine: for instance, by creating conditions for a free pace in operating the machine or free access to it. The extension of man's creative potentialities is a psychological indicator of the efficient use of artificial intelligence. Recognition that human thinking is specific, as compared with the processing of information by the computer, constitutes the methodological principle of the theory of designing automated systems, which has been acquiring ever greater

scope in the USSR.[34] The use of artificial intelligence to study natural intelligence (automation of psychological experiments) is also a promising line of research.

* * *

I think that a new relationship should be established between psychological science and "artificial intelligence" as a scientific field. "Artificial intelligence" should take greater account of the data provided by psychological science in assessing the practical achievements, in formulating long-term programmes for improving computers and for making their use more efficient. A meaningful task for psychology is the critical assimilation, in the light of dialectical materialism, of the processes connected with the development of the new form of natural-scientific materialism in the theoretical writings on "artificial intelligence" so as further to elaborate the conceptual apparatus which makes it possible to reflect the specific regularities of mental activity.

NOTES

[1] See P. K. Anokhin, "The Philosophical Meaning of the Problem of Natural and Artificial Intelligence", *Voprosy filosofii*, No. 6, 1973; "Artificial Intellect?", *Social Sciences*, No. 2(16), 1974.

[2] Nils J. Nilsson, *Problem-Solving Methods in Artificial Intelligence*, New York, 1971.

[3] James R. Slagle, *Artificial Intelligence: The Heuristic Programming Approach*, New York, 1971.

[4] G. L. Smolyan, "Man and the Computer", *Voprosy filosofii*, No. 3, 1973, p. 42.

[5] See O. K. Tikhomirov, *The Structure of Man's Thinking Activity*, Moscow, 1969 (in Russian).

[6] Lawrence J. Fogel, Alvin J. Owens, Michael J. Walsh, *Artificial Intelligence through Simulated Evolution*, New York, London, Sydney, 1966, p. 8.

[7] See O. K. Tikhomirov, "Heuristic Programming and the Psychology of Creative Thinking", *Problems of Scientific Creativity in Modern Psychology*, Moscow, 1971; A. V. Brushlinsky, *The Psychology of Thinking and Cybernetics*, Moscow, 1970 (both in Russian).

[8] N. S. Sutherland, "Machines Like Men", *Science Journal*, October 1968, pp. 44-48

[9] See A. R. Luria, *A Small Book About a Big Memory*, Moscow, 1968 (in Russian).

[10] H. Borks (Ed.), *Computer Applications in the Behavioural Sciences*, Engelwood Cliffs, New Jersey, 1962, p. 20.

[11] See James R. Slagle, op. cit.

[12] See U. Neisser, *Cognitive Psychology*, New York, 1967.

[13] See *Human Capabilities of Machines*, p. 12 (in Russian).

[14] Ibid., p. 10.

[15] See A. N. Leontyev, *Problems in the Development of Mentality*, Moscow, 1959 (in Russian).

[16] *Oeuvres de Descartes*, Vol. XI, 1909, p. 331.

[17] S. L. Rubinstein, *The Principles of General Psychology*, Moscow, 1946, p. 63 (in Russian).

[18] Ibid., p. 59.

[19] N. M. Amosov, *Artificial Reason*, Kiev, 1969, p. 63 (in Russian).

[20] See A. N. Leontyev, "The Problem of Activity", *Voprosy filosofii*, No. 9, 1972, p. 95.
[21] I. B. Novik, *Philosophical Questions in the Simulation of Mentality*, Moscow, 1969, p. 101 (in Russian).
[22] Ibid., p. 122.
[23] N. M. Amosov, op. cit., p. 5.
[24] L. J. Fogel *et al*, op. cit., pp. 116, 123.
[25] See *Human Capabilities of Machines*, p. 13.
[26] V. M. Glushkov, "Thinking and Cybernetics", in the collection: *Dialectics in the Sciences of Inanimate Nature*, Moscow, 1964, p. 500 (in Russian).
[27] See L. S. Vygotsky, *Selected Psychological Studies*, Moscow, 1956 (in Russian).
[28] B. F. Lomov, *Man and Technology*, Moscow, 1966, p. 39 (in Russian).
[29] Y. A. Sherkovin, *Psychological Problems of Mass Information Processes*, Moscow, 1973, p. 80 (in Russian).
[30] A. M. Svyadoshch, *Neuroses and Their Treatment*, Moscow, 1971, p. 261 (in Russian).
[31] S. L. Rubinstein, op. cit., p. 25.
[32] See *Man and Computer*, Part 1, Moscow, 1972 (in Russian).
[33] See A. N. Leontyev, "Automation and Man", *Psychological Research*, Part 2, Moscow, 1970; B. F Lomov, "Information Interaction Between Man and Machine in Control Systems", *Legal and Social Psychological Aspects of Control*, Moscow, 1972 (both in Russian).
[34] See *Man and Computer*, Moscow, 1973.

Origin of the Ancient Chinese Civilisation

LEONID VASILYEV

That China has one of the world's oldest cultures is being used today by some nationalistic Chinese scholars to give a false interpretation to historical facts for political purposes. This accentuates the urgency of the question of the reasons for the perceptible similarity and, in some respects, identity between the ancient Chinese Neolithic (Yang Shao, Lung Shan) and Bronze Age (Shang Yin) cultures in the Huangho Basin and analogous cultures in the Western regions of Eurasia that had developed earlier in time. The crux of the matter is that the ancient Chinese cultural complex arose later, but then developed quite quickly. What accelerated the evolution of ancient Chinese culture?

In his search for an answer to this question the scholar inevitably finds he has to assess the role that external influences and the mutual exchange of cultural values have played in the history of man. This is not a new problem. Nobody can deny the significance of the external factor for the process of cultural evolution. However not everybody is able to appreciate it fully. Many scholars regard external influences as a secondary factor merely adding to natural evolution springing from internal causes. However, the role of external influences differs at the various phases of the development of any ethnocultural community, of the existence, under different conditions, of tribes or states. For instance, once it was established, the ancient Chinese society

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depended little on influences from without. Even such a powerful foreign cultural influence as Buddhism was remade, assimilated and sinicised to the extent that it lost its initial image and fused with the traditional forms of Chinese culture. But the case is entirely different when we deal with remote antiquity, when the foundations of Chinese civilisation were only being laid, when the later national-cultural tradition, seemingly so strong in its conservative stability, was non-existent. In remote antiquity the role of external influences, whether the migration of tribes, trade, invasions or the penetration of ideas, might have been not merely more significant but, to some extent, determining the ways and rate of further evolution. This role is often aptly compared with a catalyst,[1] which sharply speeds up a reaction and without which a reaction is often altogether impossible.

Marxist science maintains that the development of world civilisation is an integral, inter-related and mutually-conditioned process.[2] Every, even an isolated, ethnocultural community evolves in accordance with laws that are relatively common to all communities. At the same time, these laws manifest themselves differently, even under similar or comparable conditions (the natural factor, the possibility for contacts), say, in Europe, India and China. But when a large group of tribes finds itself in isolation, this absence of the possibility for intercourse with the external world fatally delays its development, despite favourable natural conditions. Exchanges of information are therefore one of the conditions for the development of society.[3] As a result of these exchanges, the achievements of one culture are assimilated by others, and this tremendously speeds up development as a whole.

But this applies not to all kinds of information. Secondary inventions and innovations could be duplicated a hundred times in various parts of the world in societies of approximately the same level of development. But the more significant an invention, the less the probability of its duplication,[4] if only for the fact that inventions such as fire, cereal farming, metallurgy and the wheel were not the accidental brain-child of a genius but the result of thousands of years of purposeful quests by advanced contingents of mankind. These quests required a colossal outlay of thinking, energy, strength and means, and the picture of the world would have been depressing in the extreme had each ancient society conducted such quests independently and in isolation, without drawing on the information on the achievements of other societies. It is unquestionable that such information sharply accelerated the evolution of societies that were prepared to accept and utilise the achievements of others.

The channels of information did not always and everywhere function quickly and successfully. Sometimes situations arose where similar or parallel phenomena called forth by the requirements of life, by the laws of evolution, were to be observed in different parts of the world. However, as a rule, these phenomena had specifics of their own. If they had not, sooner or later, levelled up through exchanges of information the difference in time might have become very

considerable and this, in turn, might have led to essential differences in the results.[5] In principle, the constant exchange of information within the framework if not of humanity as a whole then at least of large continents was a natural condition for the existence of societies, which for one reason or another were or could be among the foremost societies that were already laying the foundations of the future civilisation.

This becomes particularly evident when we consider the so-called Neolithic revolution, in other words, the complex of closely interrelated major innovations (farming, livestock-breeding, pottery-making, a settled way of life, construction, spinning and weaving, the development of rituals and cults and so forth). Their emergence ushered in a qualitative advance, namely, from a borrowing to a producing economy. This was a revolution that gave man the possibility for creating and accumulating a surplus product, which provided the foundation for the rise of an urban civilisation and the ancient states. It lasted for several millennia (10th-6th millennia B.C.) and, according to available data, took place in only one region (in the Old World)—in the hilly regions and foothills of Werstern Asia (Zagros, Anatolia, Palestine). It was there, according to the now universally recognised conclusions of the Soviet botanist and geneticist Nikolai Vavilov,[6] that wild animals and plants were domesticated,[7] that the most important Neolithic discoveries were made, and a producing way of life took shape. Then, pressured by the surplus population,[8] the first farmers and livestock-breeders began to settle in neighbouring regions, in particular in the fertile valleys of the Nile, the Tigris, the Euphrates and the Indus, where the seats of primary civilisations subsequently sprang up.

In the valleys of the Tigris, the Euphrates and the Nile the Neolithic complex appeared in approximately the 5th millennium B.C., and in the valley of the Indus somewhat later, and most scholars agree that the Indian, Mesopotamian and Ancient Egyptian civilisations had their source in West Asia. The most distant, later and unique ancient centre of primary civilisation in the valley of the Huangho, one of the most fertile rivers of Eurasia, is the only one that seemingly has no direct relation to the Middle East Neolithic revolution. But is that indeed the case?

It is known that Yang Shao, the first among the Neolithic farming cultures in the basin of the Huangho, belonged to the series of so-called painted pottery cultures and, as all the other cultures of this series genetically originating from the Middle East zone, knew all the achievements of the Neolithic revolution. The people of that culture grew cereals (mainly kaoliang), bred livestock (pigs) and domesticated dogs, lived in settlements, knew the manufacture of Neolithic implements of stone, bone and wood, were familiar with spinning and weaving and the manufacture of various types of pottery, including pottery adorned with fanciful ritual symbolic ornamentation and drawings.[9] In other words, in the basin of the Huangho, as in the basins of the Nile, the Indus, the Tigris and the Euphrates, cereal farming appeared in the shape of a developed and fully mature

Neolithic complex that had a prehistory of millennia of gradual evolution. But while in other cases this evolution has been accurately localised and recorded, thanks to which the sources of the knowledge and experience of the most ancient farmers of Egypt, Mesopotamia or India are essentially unquestionable, with regard to the sources of Yang Shao the case is much more complicated.

On the one hand, there is a perceptible and undoubted similarity between the agricultural Neolithic of Yang Shao and analogous cultures of West Asia. This similarity lies in the main thing, namely, in the fact that the people were acquainted with cereal farming and livestock-breeding, in the way of life, beliefs and notions, including the burial rite, and the symbols and significance of pottery painting. Here the similarity is expressed in the fact that in the basin of the Huangho essentially the same range of Late Neolithic achievements is represented (with very few exceptions) as is encountered in the basins of the Nile, the Indus, the Tigris and the Euphrates. There is much similarity also in details, and this becomes most convincing when one studies pottery paintings, the significance and symbols of which, as well as the technique involved, the ornament and the principles of portrayal, are basically the same in Yang Shao as in the Middle East.[10] It is no accident that after the very first finds by the Swedish archaeologist J. G. Andersson at a Yang Shao camping-site in the early 1920s, the belief that there was communication with Western cultures and that the origin of Yang Shao was non-Chinese, received wide recognition among scholars (this opinion is held chiefly by Western sinologists. In China itself the attitude to it is restrained, while in recent years it has been sharply negative). Small wonder that in those years many scholars felt that the problem was clear and that the Yang Shao Neolithic convincingly corroborated the assumption that human culture was homogeneous. However, a closer study of the Yang Shao Neolithic showed that it differed quite essentially from the West Asian Neolithic.

First, the Yang Shao people clearly proved to be Mongoloids, and for that reason it was more logical to assume their genetic link with the Chinese-Mongol Paleolithic dating from the epoch of the Sinanthropus Pekinensis and not from the Neolithic of the Middle East zone. Second, the most clearly expressed analogy in painting proved to be much later in time, belonging only to the Yang Shao epoch as a whole.[11] Third, the Yang Shao Neolithic had many features of its own (the predominant cereal was kaoliang and not wheat or barley as in the Middle East; the domestic animal was the pig and not the sheep or the goat; instead of houses of sun-baked clay the Yang Shao people built semi-dugouts with a framework and stilt, and so on). All these considerations, including the hard fact that between West Asia and the Huangho lies a vast region where no connecting links have yet been discovered, underlie the attitude of those who emphatically reject the belief that the inflow of information from without was the decisive element in the genesis of the Chinese Neolithic (this stand has been adopted by many scholars in China).

If to this is added that in the 1950s and in the early 1960s, as a result of the work of Chinese archaeologists the quantity of material increased appreciably (almost the whole of this vast array of material has been published in the Chinese language and much time and specialisation are need to analyse it), it will prove to be not surprising that ever fewer sinologists can make an expert judgement on how matters actually stand with regard to the Yang Shao Neolithic and its sources. The overwhelming majority of Chinese archaeologists are inclined to ignore altogether the problem of the genesis of Yang Shao. Their argument is approximately as follows: Yang Shao, an ancient Chinese culture, sprang up in China itself and belonged to the proto-Chinese-Mongoloids; it is not clear how, where and when it took shape; but this does not mean that there were influences or, much less, borrowings; on the contrary, the Yang Shao Neolithic appeared in the heart of the Huangho Basin and then fanned out in all directions, including the West. This standpoint has been bluntly stated in a number of archaeological publications, in particular, in publications brought out outside China.[12] It is not easy to argue with its proponents, but this does not mean that their stand on the question of the genesis of Yang Shao is invulnerable and true. It is enough to make a careful study of the works of Chinese archaeologists printed in China mainly prior to 1965, i.e., prior to the "cultural revolution", their arguments with each other about the different cultures, variants and phases of Yang Shao and their interpretation of available data; it is enough to consider all this without bias against the background of the common laws of the evolution of world civilisation to place the question of the genesis of Chinese civilisation, the Yang Shao culture in particular, in a different light. Moreover, it is important to note that the abundant data in the archaeological publications of the 1950s-1960s convincingly corroborate the above-mentioned general assumption about the role played by external information in speeding up the rates of development.

How then did the Yang Shao culture emerge? One of the few researchers studying this problem with the entire arsenal of modern knowledge, Chang Kwang-chih, has spent much energy and time to find the answer to it but he has been unable to achieve any appreciable headway. For instance, his theory that the developed Yang Shao Neolithic was preceded by a more primitive Neolithic age (even a sub-Neolithic, that is, an age when some Neolithic achievements were known but others, including most important ones, were not, for example, cereal farming) does not, on the whole, evoke doubt. An ancient sub-Neolithic layer has been found in the Siberia-Mongolia and Southeast Asia regions and dates (particularly in Southeast Asia) from a much earlier period than Yang Shao. But archaeologists have yet to find evidence of this layer in the vicinity of the Huangho Basin. Another theory put forward by Chang Kwang-chih, namely that an independent Neolithic revolution took place somewhere in or near the Huangho Basin, obviously hangs in the air. The reason for this is not only that so far no evidence of this kind of a revolution, which lasted for many millennia in the Near East zone and can by no means be

likened to a needle in a haystack, has been found. Another reason is that no evolution of the Siberian-Mongolian or Southeast Asian type of sub-Neolithic could have led to the Yang Shao Neolithic complex without receiving the missing information from without. This is, in some measure, felt also by Chang Kwang-chih, who allows for the possibility of an impulse from without although he regards the role of this impulse as insignificant and as of "purely academical interest."[13]

However, this impulse signifies something greater than Chang Kwang-chih believed. Its function was hardly reduced to acquainting the proto-Yang Shao people with the "food-production idea", although in itself this is much more than of "purely academical interest". Essentially, the point is that a certain complex of fully developed Neolithic achievements was in some way known to the proto-Yang Shao people, who in that period were most likely still living not in the Huangho Basin and were, culturally, on the same level as the sub-Neolithic tribes of the cord-marked pottery culture of the Siberian-Mongolian or Southeast Asian type. It is because of this fruitful synthesis that there was no need for the millennia-long Neolithic revolution; and having borrowed knowledge from without the proto-Yang Shao people began to develop and settle the Huangho Basin. But where and how did this synthesis take place?

The painted-pottery agricultural Neolithic in the Huangho Basin is represented by many hundreds of camping-sites, which are quite evenly distributed between the two main zones — the western, Kansu, and the central, Shensi-Honan zones. As a rule, these are thin (between 1.5 and 2 metres), single-layer camping-sites, which represent approximately 150-200 years of habitation; somewhat thicker layers (up to 5-7 metres), including two- and three-layer sites, occur mainly in the western, Kansu, zone, where the painted-pottery Neolithic existed for a longer period. In the central zone there are two basic variants of the ancient Chinese Neolithic, Pan-p'o and Miao-ti-kou, the difference between them being that in Pan-p'o the quantity of painted pottery is smaller, while the painting itself is poorer and more primitive than in Miao-ti-kou.[14] The question of the correlation between these variants has not been settled,[15] but the view offered by Shi Hsing-pang and Su Ping-chi that both variants probably existed in parallel merits most attention.[16] In any case this does not settle the question of the genesis of Pan-p'o and Miao-ti-kou. In the central zone there is no evidence of the pre-Yang Shao Neolithic from which Pan-p'o and Miao-ti-kou could have stemmed, but with their different style and painting these variants could obviously not have sprung from each other. On the other hand, the sources of both these variants are to be found in the western zone of Yang Shao. However, in their endless arguments about the relationship between Pan-p'o and Miao-ti-kou Chinese archaeologists pass this over in silence. More, they speak tirelessly of the primacy of the central zone of Yang Shao in relation to the western zone and thereby beforehand reject the possibility of raising this question in any other way.

In the Kansu zone the Yang Shao sites fall into a western and an eastern subzones. In the former most of the sites are of the Kansu

Yang Shao (Ma-chia-yao) type, and in the latter the sites are of the "Yang Shao in Kansu" type, which is close to the Yang-Shao of the central zone. Chinese archaeologists have noted the regularity that closer to the junction between the subzones (the area between the Weiho and Taoho rivers) the Yang-shao sites had a strong admixture of Ma-chia-yao, and the Ma-chia-yao sites had a large admixture of Yang Shao, while the more or less "pure" Ma-chia-yao and Yang Shao sites were closer respectively to the western and eastern fringes of the zone.[17] In other words, the two cultures mixed, as it were, and this mixture was more pronounced closer to the junction between them. It would seem that this should lead to the conclusion that such clearly interacting kindred cultures existed at one and the same time.

However, Chinese archaeologists in advance adopt the attitude that Yang Shao preceded Ma-chia-yao, and this places them in a difficult position. In their efforts to uphold the primacy of Yang Shao they base themselves on data from the Wa-chia-ping site in Kansu, where the upper, more or less "pure", Ma-chia-yao layer overlies mixed layers ("Yang Shao in Kansu" with an admixture of Ma-chia-yao).[18] Despite its singularity, this fact has not been questioned or regarded as accidental. On the contrary, it has been accepted as a convincing proof of the primacy of Yang Shao generally, and also of the primacy of this culture also in the central zone, where Chinese archaeologists single out "Yang Shao in Kansu". However, it is somehow overlooked that despite its "primacy", the "Yang Shao in Kansu" culture mixed with the Ma-chia-yao culture, in other words, that these cultures existed practically simultaneously. It will be noted that the theory about the mixture of these cultures was advanced by Chinese archaeologists themselves; in the mixed Yang Shao-Ma-chia-yao sites there is indeed a blending of elements of Yang Shao and Ma-chia-yao but not a transformation of the former into the latter. This means that there were two different, kindred cultures and that they interacted. In Chinese literature the accepted view is that Yang Shao appeared from the central zone. Then where did Ma-chia-yao, which interacted with it, originate?

If the theory about the priority of Yang Shao in the central zone is accepted, we shall find ourselves in a vicious circle: the origin of two variants, Pan-p'o and Miao-ti-kou, in the central zone itself is not clear; neither is the origin of Ma-chia-yao ascertained in the Kansu zone. What is clear is that the "Yang Shao in Kansu" culture came from the centre, and for Chinese archaeologists this is the main thing. This theory is reinforced by the first results of a radiocarbon analysis published in China in 1972: the age of Pan-p'o is 5,600-6,080 ($\pm$ 150) years, and that of Ma-chia-yao 4,150 years.[19] In other words, the chronological gap between Pan-p'o and Ma-chia-yao is equal to 1,500-2,000 years. It will be borne in mind that even in laboratories with a much greater experience of radiocarbon analysis errors (in the order of millennia) occur quite frequently. One can, of course, understand the exaggerated gap between obviously kindred and, besides, interacting cultures located near each other (hardly 200-300 kilometres on a good road along the Wei River) as a striving to prove,

as convincingly as possible, that the culture of the central zone was primary. But this is exactly what evokes doubts. The gap is clearly incredible, requires an explanation and sheds light on nothing.

One can, however, regard the cited facts from somewhat different positions, by considering the circumstances to which Chinese archaeologists attach no particular significance. First and foremost, it will be noted that as distinct from the central zone, Kansu has not yielded Pan-p'o or Miao-ti-kou types in the Yang Shao cultures proper.

Had the Kansu zone been secondary these variants would have inevitably manifested themselves in a way. Yet at the Yang Shao sites in Kansu features of both variants in the shape of a non-differentiated whole have been recorded. Further, archaeologists have found a definite similarity between the Miao-ti-kou variant in the central zone and the Kansu Yang Shao,[20] and this is noteworthy if it is remembered that the sources of the Miao-ti-kou variant have not yet been traced in the central zone. Taken together with the contradictions in the question of the relationship between Yang Shao and Ma-chia-yao in Kansu, which we have mentioned, all this gives grounds for reconsidering the now habitual presumption of Chinese archaeologists that the central zone was primary and give a new interpretation of the accumulated archaeological facts.

Let us assume that Ma-chia-yao and Yang Shao proper, which allegedly mixed with each other in Kansu, were indeed not two different interacting cultures but two kindred variants with their roots in a common source in the centre of the Kansu zone and spreading out to its poles, to the west and to the east from the region between the Taoho and Weiho rivers. Formally, this is quite justified: the division into Yang Shao and Ma-chia-yao made by Andersson in the 1940s is conditional, while the kinship of these cultures is unquestionable. From a purely archaeological standpoint this is not only acceptable but even preferable: it removes the contradictions linked with the problem of the genesis of Ma-chia-yao and the merging of Yang Shao proper with the Ma-chia-yao culture, whose origin is unknown and which is assumed to date from a later period; it resolves the problem of Miao-ti-kou, which has its roots in Kansu; and, lastly, it sheds light on the problem of the genesis of Pan-p'o, a problem that has still not been resolved for the central zone. The only thing that clashes with the proposed assumption (apart from the radiocarbon data) is the accepted interpretation of the Wa-chia-p'ing site. However, a more attentive evaluation of all the data specifying the character of the layers in fact removes this contradiction as well: the upper layer ("pure" Ma-chia-yao) of the site overlies the lower mixed layer, which is typical of precisely the junction area on the upper reaches of the Weiho, and this is mentioned by the author of the publication.[21] In other words, the data from Wa-chia-p'ing reinforce the conclusion that in the heart of the Kansu zone there was an earlier mixed forerunning culture of the proto-Yang Shao-Ma-chia-yao type.

Available archaeological material gives grounds for assuming that as they moved eastward along the Weiho the descendants of a branch

of this forerunning culture gradually acquired the cultural indications that became typical at first for "Yang Shao in Kansu" (non-differentiated Yang Shao proper with some indications of Ma-chia-yao) and then, as they moved farther, for the Yang Shao of the central zone with its established basic variants — Pan-p'o and Miao-ti-kou. Another branch of the descendants of the forerunning culture that moved westward, led, in time, to the formation of the more or less "pure" Ma-chia-yao, a layer of which was found to overlie the earlier layer of the forerunning mixed culture in Wa-chia-p'ing.

At first the Ma-chia-yao and the "Yang Shao in Kansu" variants and then the entire Yang Shao culture of the central zone (the main sites of which, including Pan-p'o and Miao-ti-kou, have analogies in Kansu) appeared in the course of this division of the mixed forerunning culture. On this basis it is easy to explain not only the absence of traces of the pre-Pan-p'o and pre-Miao-ti-kou agricultural Neolithic in the central zone but also the non-differentiated character of "Yang Shao in Kansu", the proximity of the latter to Ma-chia-yao and even the gravitation of the more mixed sites of the Yang Shao-Ma-chia-yao type toward a definite centre in the region between the Taoho and Weiho rivers. Only one point remains unclear: Where did this forerunning culture come from? Whereas the first traces of the Chinese agricultural Neolithic are found not in the centre of the Huangho but near its sources (in the western extremity of China proper), the search by scholars for analogies and possible sources of Yang Shao in the west is natural and justified.[22]

The discovery in the Himalayan India of a specific sub-Neolithic culture of hunters and food-gatherers of the Bursahom (near Srinagar) type, which obviously sprang from the Mongoloid Siberia-North China zone of the early Neolithic, makes it possible to assume that since a culture of this type, having moved across the great mountain ranges, found itself in India, this signifies that similar ranges were surmountable prior to the 3rd millennium B.C., from which the early layers at Bursahom are dated.[23]

The sporadic contacts of the hunters and food-gatherers of the Bursahom-type sub-Neolithic with the farmers of the developed Neolithic who, in search of new land, had migrated somewhere to North India or Afghanistan, evidently might have enabled the local tribes to accumulate information and even borrow the basic principles of the domestication of cereals and livestock, become acquainted with painted pottery, and so on. Attention should also be drawn to the fact that this pottery was made by women, who, when there was war, were usually taken captive and incorporated in the victor tribe. In cases where tribes of hunters and food-gatherers, who had already been enriched with information and were prepared for the transition to agriculture, migrated to more or less favourable foothill regions, where the conditions obtained for the transition to settled farming, for the domestication of some new cereals (kaoliang) and species of livestock (the pig), they could accomplish the millennia-long Neolithic revolution in several centuries. After this, a group of descendants of this tribe could, in their search for new lands, ultimately reach the

region between the Taoho and the Weiho and from there begin the settlement of the Huangho Basin.

Such is a hypothetical reconstruction of a possible process. We feel that its advantage is that, first, it takes into account and brings into a definite system all the facts known to archaeologists; second, it allows settling the contradictions we have mentioned; lastly, it gives the possibility of placing the problem of the genesis of the Chinese agricultural Neolithic on a realistic foundation and explaining the fact of the unquestionable identity of Yang Shao with other painted pottery cultures of Eurasia and the reason for its essential distinctions from all of them. It must be stressed that the Yang Shao Neolithic, which took shape in the course of a complex ethnocultural synthesis, was a Chinese culture and that its people were the first, unquestionable proto-Chinese.

On the borderline between the 3rd and 2nd millennia B.C. the shortlived Yang Shao culture in the Huangho Basin was superseded by the Lungshanoid black-grey pottery culture that subsequently spread also to the south of the Huangho. Although the Lung-shan culture took shape on the basis of Yang Shao, it had essential distinctions. It was familiar with the West Asian domesticated cereals (wheat, barley, millet), with the domesticated animals (bull, ram) bred there, with new types of utensils (including the tripod "li") the potter's wheel and the practice of scapulimantia (fortune-telling with the aid of animal bones). There are grounds for surmising that, as in the case of Yang Shao, external components played a role in the genesis of Lung Shan. This new culture, too, stemmed from a complex synthesis of various elements.

In the 3rd millennium B.C., a group of Neolithic tribes of herders emerged[24] with the spread of agriculture to the outskirts of the West Asia zone, particularly in the steppes to the north of it, where farming was impracticable, these tribes not only moved over a huge territory from the Black Sea to Mongolia, but constantly absorbed all the new sub-Neolithic tribes of hunters and food-gatherers, including the Mongoloid tribes that inhabited the eastern part of this zone. In the course of this process the tribes of neo-herders north of the Huangho could have acquired the cultural elements (domestication of cattle, acquaintanceship with the potter's wheel and the accompanying manufacture of non-painted black-grey pottery made by artisans, and the scapulimantia and "li"-type utensils typical for herders), which then spread to Lung Shan. Evidently this interaction of tribes of this type with the Yang Shao farmers led to the rise of the Lung Shan cultural complex, the earliest phase of which was most likely the Ch'i-chia culture in Kansu.

This culture was characterised by the almost total absence of painted pottery (on account of which Andersson erroneously dated it from pre-Yang Shao times) and the predominance of crude pottery ranging in colour from brown-red and black to grey and white. The Ch'i-chia pottery, most of whose forms ascended from Yang Shao, is distinguished not so much by an abundance of new types (for instance, the "li" tripod) as by a different ornamentation: the

prevalence of the cord and pectinate ornamentation and also the polishing of thin-walled pottery. The potter's wheel, possibly, was used not for the manufacture of pottery, but for giving it a gloss. The Ch'i-chia stone implements resemble the Yang Shao implements, but in addition, typical Lung Shan scythe-like knives are encountered. The dwellings are of the Yang Shao type, but with walls plastered with lime, which is a characteristic of Lung Shan. The Ch'i-chia people bred cattle, were acquainted with scapulimantia, made articles of bronze, which was evidently imported, or articles of native metal.[25] The cultural image of Ch'i-chia thus allows drawing the conclusion that having emerged in Kansu on the basis of the Yang Shao-Ma-chia-yao culture it received its major innovations (cattle, the potters' wheel, new methods of processing pottery, knowledge of metal) from without, most probably as a result of contacts with the livestock-breeding outlying areas north and northwest of Kansu.

The cultural transformation of Yang Shao proceeded in the central zone as well: in the transitional Miao-ti-kou II-type culture we find a prevalence of grey and reddish cord-marked pottery, the appearance of scythe-like stone knives, lime-plastered walls and so on, although the source of these innovations is unclear: was it solely a result of spontaneous evolution or of contact with Ch'i-chia. In any case, the Miao-ti-kou II type was transitional and provided the basis for the emergence of local modifications of the developed Shensi and Honan Lung Shan. Farther east, the Honan variant was acquainted with the potter's wheel and black glossy pottery; the "li" tripod is not typical for it, and there are no traces of cattle-breeding or that scapulimantia was known. Farther west, in the Shensi variant, which neighboured on Ch'i-chia, knew cattle, scapulimantia and the "li" tripod, but black pottery and the potter's wheel played an insignificant role.[26]

In other words, culturally and geographically the Shensi variant is half-way, as it were, between Kansu Ch'i-chia and Honan Lung Shan. If all the variants are placed in one line, it will be found that (with a practically equal archaeological study of Kansu, Shensi and Honan) they have a definite regularity in common: Western Ch'i-chia, of which there are hundreds of sites, gives way in the east to less representative variants (ten sites at the most); the large Ch'i-chia cultural complex gives way to a more modest sum of the same indications in Shensi (pectinate and white pottery, and copper are absent) and a still more meagre range of these indications in Honan (cattle and scapulimantia are unknown and there are practically no "li" utensils). The decrease of the range of fundamentally important identical innovations of the Lungshanoid layer from west to east brings one round to the assumption that this was the direction of cultural influences. However, in itself the range of innovations does not determine everything: the Honan variant with its broad use of the potter's wheel and its abundance of thin-walled glossed pottery was clearly on a higher level of development than the Shensi variant. The Pao-tou variant emerged in Shantung, East China, on the basis of the Honan Lung-Shan, although some scholars believe the genesis of this variant, on the basis of which the late "classical" (Cheng-tzu-yai)

Lung Shan appeared, was influenced by other cultures of the Lungshanoid layer, in particularly by the southern Ch'ing-lien-kang-Liu-lin.[27]

Evidently the south Lungshanoid Ch'ü-chia-ling and Ch'ing-lien-kang cultures likewise took shape on the basis of Yang Shao. They were acquainted with the basic cultural indications of Lung Shan (black glossy pottery, the potter's wheel, and so on), but had specific features, for instance, the cultivation of rice, the unique painting on pottery and fanciful forms of "tou" vessels (wine-glass-type with a thin, high base) and the "ting" tripod (pots on three thin long flat finger-like legs).[28] If to this is added the acquaintanceship of the south Lungshanoid cultures with kettle-like vessels, that do not occur in Yang Shao and Lung Shan but are well known from the painted pottery of the Deccan, the problem of yet another line of possible cultural contacts within the South Asia rice-growing zone will complicate the already difficult question of the genesis of these cultures. However that may be, the question of the genesis of Ch'ing-chia-ling and Ch'ing-lien-kang remains unclear. It may be surmised that the development of these south Lungshanoid cultures took place parallel with the formation of different variants of developed Lung Shan in the Huangho Basin and that the basic direction of the cultural influence in the south was most probably from west to east, because in the east, somewhat south of Shan-tung, there were later, developed variants of the Ch'ü-chia-ling-Ch'ing-lien-kang cultural type, for instance, Liu-lin. These two parallel and simultaneous torrents of the Lungshanoid cultural influence met somewhere in Shantung and this resulted in the appearance of the Pao-tou (and then the "classical") variant of the late Lung Shan, at which the evolution of this culture practically stopped.

In all its modifications, the Lung-shan-Lungshanoid Neolithic of black-grey pottery led to the spread of agriculture in a large part of China proper, while the burgeoning of the agricultural Neolithic and of the producing economy laid the foundation for the emergence of a town civilisation in the Huangho Basin. In China the first centre of this civilisation appeared in the Yin epoch, approximately in the mid-2nd millennium B.C., i.e., two or three thousand years after similar centres appeared in Egypt or Mesopotamia. The latest Chinese historiographic tradition describes the Yin people as a restless tribe that sporadically changed its place of habitation, was acquainted with farming, livestock-breeding, metallurgy and a written language, held sacred their horse-drawn war chariots and worshipped Shang Ti, whom they regarded as their supreme deity and progenitor. Lately this tradition has been reinforced by the archaeological excavations at Yin towns (An-yang and Cheng-chou) and sites with palaces and hovels, walls and artisan workshops, bronze vessels, and inscribed fortune-telling bones. The sumptuous tomb-mausoleums of the Wangs, the Yin rulers, who were buried together with luxurious vessels, richly-ornamented weapons and hundreds of people, have been excavated. Archaeologists have discovered a highly-developed

culture that differs strikingly from its primitive Neolithic predecessors. Naturally, the question of its sources and links arose.

There is no doubt that many of the Yin cultural indications sprang up on the local, Yang Shao-Lung Shan Neolithic soil.[29] At the same time, some of the key indications (metallurgy, war chariots, bronze weapons, the technique of erecting large buildings, a developed art, and a written language) are in sharp contrast to all that was known to the Chinese Neolithic. The development level of these elements of the Yin culture calls in question the assumption that they appeared in embryonic form on local soil and gradually developed, because this required millennia-long evolution. Only an intensive inflow of information from without could have speeded up the rate of evolution. This is seen from the example of all the essential innovations of Yin, beginning with bronze. A study of the excellent Yin bronzes has shown that they have their own specifics in the technique of use and the technology of manufacture, in the chemical composition and in the principles of casting (multi-sectional component ceramic forms as distinct from the *cire-perdue* principle used at the other ancient centres of metallurgy). This undoubtedly resulted from the long experience of the Chinese potters: it is not accidental that the Yin bronze vessels were copies of the Yang-shao-Lu-shan pottery. But all this is obviously insufficient grounds for asserting that Yin metallurgy was entirely autochthonous.[30] Scholars who do not confine their interest solely in Yin metallurgy draw attention to the general regularity of the spread of information on metallurgy, with regard to which the Yin specifics are only secondary particulars.[31]

This conclusion is convincingly reinforced by an analysis of Yin bronze weapons. Yin weapons, utensils and bronze ornaments have unquestionable parallels and analogies in the cultures of the steppe belt north of West Asia and the Huangho Basin. The character of the links is not quite clear and evokes contradictory assessments. But a comparative study of Yin weapons has shown that some types, notably with socketed handles, could not have appeared in China on the basis of local stone prototypes. The existence of analogues and ancestor-transitional forms of such types in other regions of Eurasia is evidence that they were borrowed from without in ready-made form.[32] This also concerns the articles of the so-called animal style.

Even more unquestionable are the analogies between the Yin and West Asian chariots. Here there can be no question of accidental coincidences, especially as the primitive cart, as a transitional phase, and the domesticated horse were not known to the Chinese Neolithic. On the other hand, the cult of the horse and the war chariot, used as the main weapon and highly valued by the Yins, is in all its details reminiscent of an analogous cult among some West Asian peoples of the Hurrit-Mittani and Indo-European groups. But thousands of kilometres lie between West Asia and Yin China and throughout that vast territory almost no traces (with one exception) have been found of chariots. We have in mind the Karasux culture of South Siberia, whose bronze articles are reminiscent of the Yin articles. This was noted by many scholars, who studied the question of cultural contacts

between the Yins and the Karasux people. Among the bronze articles of the Karasux people there are enigmatic "objects of unknown use". These are rectangular plates, whose edges were bent in the form of an arc and were decorated with little bells or pendants in the animal style, most frequently in the form of horses' heads, they were miniature copies of Yin plates that were evidently used to fasten chariot traces. (True, there are other explanations of their use in the equipment of chariots and chariot-drivers[33]). The conclusion suggests itself that the ancestors of the Karasux people were familiar with chariots, but buried this weapon in oblivion, preserving the memory of it in miniature articles of a truly "unknown purpose", utilising it most probably in the practice of their cult. The Karasux culture may thus be interpreted as an indirect indication of the direction of the cultural links through which the ancestors of the Yins became acquainted with chariots and, consequently, with horses and many kinds of weapons and utensils.

The architecture of the Yins merits attention. They built strong town walls, palaces and mausoleums, utilising packed foundations and an intricate technique of interlacing ceiling beams resting on columns along the perimeter of the building. The architecture of the Yins was as sharply in contrast with the analogous practice of the Yang Shan or Lung Shan people as the splendid Yin bronze articles with the pottery or stone implements of the Neolithic. This is seen most strikingly in the mausoleums — huge cross-shaped pits with a central chamber for the sarcophagus and with four-side chambers (with exit passages on the surface), in which people and articles were buried with the deceased. Chinese archaeologists, who excavated these tombs, compared them, notably, with the royal tombs of Ur, where many people were found to have been buried together with the deceased. Needless to say, this does not mean that the Yins borrowed this bloody practice from Ur. It only means that the Yin and the Ur rulers had similar notions about the nether world and had approximately similar possibilities for putting these notions into practice. As regards the reasons for this similarity (in the long run, not all rulers acted in this manner: human sacrifice at burials was not practised either by the Pharaohs or by many other Eastern despots), there is considerable evidence of the existence of cultural and genetic contacts.

Some cultural elements of Yin likewise testify to approximately the same kind of links. Yin art was magnificent. There were exquisitely ornamented bronze vessels and figures in relief with a perfect ornamentation; fine stone sculpture, fanciful patterns on stone and bone, articles made of jade, and so on. The Yin relics occupy an esteemed place in museums throughout the world. Among the objects of Yin plastic art and relief ornamentation attention is attracted by articles made in the animal style, which is very specific. This style portrays some animals in a dynamic posture, which is quite different from the usual portrayal of animals, for instance, in the ancient Chinese Neolithic. Another feature of Yin art is the fine carving on bone and wood, carved and applied ornamentation on

pottery, which in many ways duplicates the ornamentation on bronze vessels and differs from the Lung Shan and Yang Shao ornamentation. Note must be made of the new motifs and types of ornamentation and drawings. In Yin ornamentation the central place is occupied by the tao-tieh mask, portraying a monster with huge round eyes, great branching horns, often with a large mouth, nose and the body of an animal, dragon or even man(there are good grounds for believing that the tao-tieh were iconographic portrayals of Shan-ti, the Yin supreme deity-progenitor). The portrayal included animals, snakes, dragons, cicadas, fish, intricate spirals and zigzags. Frequently there also were human faces, usually executed in a realistic manner and convincingly showing that the Yins were familiar with different racial types, including faces with clearly expressed Negro-Australoid and Europoid features.[34]

A few words about the calendar and the written language. The fact that the calendar-astronomical and astrological notions of the ancient Chinese coincided with analogous notions of other ancient peoples (Indians, Babylonians and Chaldeans) has been noted by many scholars, some of whom assumed that the Chinese probably borrowed the corresponding notions, for instance, the 12 signs of the Zodiac or the duodecimal and sexagenary cycles.[35] Here the similarity is unquestionable. Besides, the later formation of the Chinese centre of civilisation provides grounds for conclusions of this kind. As regards the spoken and written languages, the problem is much more difficult. At one time many scholars argued that the Chinese written language was autochthonous. Present-day Chinese authors attempt to substantiate this thesis by analysing Yin and more ancient Neolithic symbols.[36] But this comparison provides little: the ancient symbols differ sharply from the An-yang written language, which has much more similarity with the Sumerian hieroglyphs.[37] However, this problem remains unresolved. New light may be shed by a linguistic analysis, in particular by comparing Yin words and ancient Indo-European words. Such comparisons have become possible only after the reconstruction of the ancient Chinese language suggested by B. Karlgren.[38] On the basis of this reconstruction sinologists and linguists raised the question of the existence in the ancient Chinese language of sounds close to the sounds of Indo-European ancient words.[39] The number of these analogies runs into hundreds, although the conclusions of the scientists who have suggested them (Ulenbrook and Ulving) are naturally still very cautious.

At first glance, much of the aforesaid may prove strange: China and the Indo-Europeans? Doubts may be and are raised by parallels and analogies in the sphere of metallurgy, building, art and even such an unquestionable analogy as the case with the chariot. However, close attention must be paid to the fact that these coincidences, albeit incredible, are much too numerous for a simple accident. Taken together, in combination with each other, they form a fairly formidable cultural complex, which, partially at least, is not rooted in China. But how did all this ultimately become an element of the Yin civilisation? The question is a difficult one, and it can only be

answered, even with the data from the archaeological discoveries of the 1950s and the 1960s, in a hypothetical form. The new excavations at Cheng-chou (Er-li-kang, Lo-ta-miao) and Er-li-tou have placed the question of the phases of the development of Yin on a more or less realistic foundation. The Cheng-chou phase, which preceded the An-yang phase, may be subdivided into the following stages: Lo-ta-miao, Er-li-t'ou and Er-li-kang. They show the gradual formation of a new quality in the evolution from Lung-shan to early Yin. For instance, there are still few Yin indications at Lo-ta-miao sites: these are mainly a new type of pottery with carved and applied ornamentation.[40] In Er-li-t'ou there are small articles made of bronze (knife, awl, spearhead, small bell), although, essentially speaking, no traces of casting have been discovered. The pottery is typically Yin not only in form (for instance, tetrapodes, which were unknown in Neolithic China) and ornamentation but also in painting (complex relief compositions with dragons and the tao-te mask). Also clearly expressed is the typically Yin method of construction by ramming earth in wooden frames (hang-tu). This method was used for laying foundations.[41] Er-li-kang, if we leave aside the difference in scale (this was a large town with a wall and with workshops), had only one fundamental feature distinguishing it from Er-li-t'ou — a developed bronze industry casting vessels (similar to those cast at An-yang) and weapons, including socketed celts of the Andronovo-Turbin type.[42]

The Lo-ta-miao-Er-li-t'ou-Er-li-kang line was thus an early Yin complex whose evolution proceeded on the local Neolithic basis and included elements about whose origin little can be said. But even if it is assumed that all this, including the developed bronze-casting industry, took shape in China itself with minimum information from without, say from wandering smiths[43] in the Huangho Basin, the early-Yin Cheng-chou complex on the whole is still sharply in contrast to the later An-yang, which had a written language, war chariots, large mausoleums with hundreds of burials, palaces, the animal style of painting, splendid stone sculpture, bone carving and so on, all which were unknown to the early-Yin complex. In other words, even if the late-Yin An-yang complex sprang from the early Yin Cheng-chou. this basis was clearly insufficient for it. One more ethnocultural component, evidently, kindred to Karasux, had to take part in the process of the genesis of the An-yang complex, the only one that can be regarded as a centre of civilisation in the full sense of the word. It is unclear how, when and where the local, Chen-chou basis merged with foreign elements that are typical solely of the An-yang complex, although it may be assumed that here a role was played by the migration of chariot-owning tribes such as the Hyxos, Kassites or Aryans across the steppe belt.[44]

All this does not mean that Chinese civilisation was brought from without. It should not be forgotten that the hypothetical cultural torrent, whose interaction with the local foundation led to the formation of the ancient Chinese centre of civilisation, could realise its potentials precisely in the Huangho Basin and not anywhere else, because there had to be sufficiently favourable conditions for an

active creative assimilation of information. These conditions were created by the Neolithic generations of proto-Chinese in a situation that was optimal for the burgeoning of a farming culture. As for the Yins with their clearly heterogeneous origin and various ethnocultural links, they could only consolidate themselves on that foundation and give an impulse to the further evolution of the ancient Chinese society. After taking over the cultural potentials of the proto-Chinese and the Yins — those created by their own development in the course of long centuries and those that they had borrowed from without along the channels of world information — this society began to develop mainly in accordance with its own inner laws. The role of the contacts with time diminished, while the native potential become larger, and this enabled it to absorb with relative ease the innovations borrowed subsequently and adapt them to the specifics of the established Chinese civilisation.

In the course of millennia the specifics of China became more and more pronounced, turning into a kind of symbol of unshakable stability and originality. The Chinese (perhaps sinicised) names of the ancient sages and rulers only reinforced the belief that since remote antiquity China has been the centre of a high culture and the source of cultural radiation, and that in this respect it owes nothing to anybody. This idea of absolute autochthony continues to play a major role in the propaganda arsenal of Great Han chauvinism. Indeed, China has a great culture with century-old traditions and nobody intends to belittle its significance. The point is that as any other civilisation, Chinese civilisation took shape in the process of constant cultural contacts, interaction and borrowing.

NOTES

1 See A.Mongait, *Archaeology Today*, Moscow, 1963, p.52 (in Russian).

2 See S.Artanovsky, *The Historical Unity of Mankind and the Mutual Influence of Cultures*, Leningrad, 1967 (in Russian).

3 As Childe noted, the speed of mankind's development is incommensurate with the rate of evolution of the organic world on account of man's ability to learn from his neighbour, to master the achievements of others [see V.K.Childe, "A Prehistorian's Interpretation of Diffusion", *Independence, Convergence and Borrowing in Institutions, Thought and Art*, Cambridge (Mass.), 1937, p. 4].

4 Attention was drawn to this, in particular, by R. J. Forbes in *Man the Maker. A History of Technology and Engineering*, London, 1950, pp. 9-10.
Major inventions were made only once and then spread from one centre. This is the opinion of many scholars. See, in particular, J.Needham, *Science and Civilisation in China*, Vol.I, Cambridge, 1954, p.229; H.S.Harrison, "Discovery, Invention and Diffusion", *A History of Technology*, Vol.I, Oxford, 1954, p.64.

5 Suffice it to mention that primitive cord-marked pottery and root-plant farming spread in Southeast Asia. Evidence of this is given, in particular, in the latest publications of archaeologists. See W.G.Solheim, "New Directions in Southeast Asian Prehistory", *Anthropologica*, N.S,, Vol.XI, 1969, No.1; Chang Kwang-chih, *Fengpitou, Tapengeng and the Prehistory of Taiwan*, New Haven, 1969; C.Chard, *Early Radiocarbon for Pottery in Japan and Implications; Proceedings of the 7th International Congress of Anthropological and Ethnographical Sciences*, Vol.V, Moscow, 1970 (in Russian). But whereas in the West Asian region the transition to cereal farming and all the accompanying innovations did indeed prove to be the

foundation for the further acceleration of development and the formation of the basis of civilisation, in the Southeast Asian region root-plant farming did not range beyond the limits of a secondary economy that only helped the main branches—hunting and fishing—at least until the peoples of Southeast Asia became acquainted with cereal farming (circa 3rd millennium B.C.).

6 See N.Vavilov, *Problem of the Genesis of World Farming in the Light of Present-Day Research*, Moscow-Leningrad, 1932 (in Russian). On the investigations of Vavilov and their assessment see: O.Sauer, *Agricultural Origins and Dispersals*, New York, 1952, p.21; R.Coulborn, *The Origin of Civilised Societies*, Princeton, 1959, p.53.

7 For details see P.Zhukovsky, *Cultivated Plants and Their Kin*, Moscow, 1964 (in Russian); C.A.Reed, "Animal Domestication in the Prehistoric Near East", *Science*, 1959, Vol.130, pp.1629-1638; F.E.Zeuner, *A History of Domesticated Animals*, London, 1963.

8 For details see V. Masson, *Central Asia and the Ancient East*, Moscow, 1964 (in Russian); V. Masson, *The Jeitun Settlement*, Moscow, 1971 (in Russian).

9 See A.Reshetov, N.Cheboksarov, "Anthropology and Ethnography on the Origins of the Chinese", *Social Sciences*, No.2 (12), 1973.

10 See A.Bulling, *The Meaning of China's Most Ancient Art*, Leiden, 1952; B.Rybakov, "Cosmogeny and Methodology of the Eneolithic Farmers", *Sovietskaya arkheologiya*, 1965, Nos.1,2.

11 J.G.Andersson, "Researches into the Prehistory of the Chinese", *Bulletin of the Museum of Far Eastern Antiquities*, Stockholm, 1943, No.15, pp.287-291. It must be noted that new discoveries (at the Miao-ti-kou site) date this analogy from a much earlier period.

12 Cheng Te-kun, *Archaeology in China*, Vol.I, *Prehistoric China*; Vol.2, *Shang China*; Vol.3, *Chou China*, Cambridge, 1959, 1960, 1963; Chang Kwang-chih, *The Archaeology of Ancient China*, New York, 1st ed., 1964; 2nd ed., 1968.

13 Chang Kwang-chih, Op. cit., 1st ed., 1964, p. 54.

14 Both variants are dealt at length in the monographs: *Miao-ti-kou yu San-li-chiao*, Peking, 1959; *Sian, Pan-p'o*, Peking, 1963.

15 An Chih-min (*Sian. Pan-p'o*) and Yang Chien-fang ("A Critique of 'Miao-ti-kou yu San-li-chiao'", *K'ao-ku*, 1961, No.4) believe that Miao-ti-kou came first; the priority of Pan-p'o is favoured by Wu Ju-tso and Yang Chi-ch'ang ("On Some Problems of the Monograph 'Miao-ti-kou yu San-li-chiac'", *K'ao-ku*, 1961, No.1 and also by Wu Li, Chang Shih-chuan, *K'ao-ku*, 1961, No.7) and others.

16 Shih Hsing-pang ("Some Problems of the Ma-chia-yao Culture", *K'ao-ku*, 1962, No.6, p.326) was the first to raise this question; it was enlarged upon by Su Ping-chi ("Some Problems of the Yang-shao Culture", *K'ao-ku hsuehpao*, 1965, No.1). Their view was accepted by Li Shih-kuei, whose excavations in Hsia-meng-tsung (where the lower layer belonged to Pan-p'o, and the upper to Miao-ti-kui) convinced him only that one neighbouring culture developing in parallel accidentally overlay another (Li Shih-kuei, Tseng Chi, "On the Question of the Character and Dating of the San-li-chiao-Yang-shao Culture", *K'ao-ku*, 1965, No.11).

17 Kuo Teh-yung, "Archaeological Investigations in the Wei-yuan, Lung-hsi and Wu-shan Districts on the Upper Reaches of the Weiho, Kansu", *K'ao-ku t'ung-hsün*, 1958, Nos.7-8; Chang Hsueh-cheng, "Relics of Ancient Cultures of Kansu Province". *K'ao-ku hsüeh-pao*, 1960, No.2, pp.12-13.

18 Chang Hsüeh-cheng, "A Report on Archaeological Survey of the Lin-t'ao and Lin-hsia Districts, Kansu Province", *K'ao-ku tung-hsün*, 1958, No.9, pp. 38-41.

19 An Chih-min, "On the Problem of Dating Primitive Cultures of China", *K'ao-ku*, 1972, No.1, p.58; Kuo Mo-jo, "Development of Types of the Ancient Chinese Written Language", *K'ao-ku*, 1972, No.3, p.2.

20 This is a reference to the similarity of the finds at the Hsi-yin-ts'un site (Miao-ti-kou type) and the Yang Shao sites in Kansu (Yang Chien-fang, "On the Dating of the Yang Shao and Ma-chia-yao cultures", *K'ao-ku hsueh-pao*, 1962, No.1, p.70).

21 Chang Hsüeh-cheng, "Report on an Archaeological Survey of the Lin-tao and Lin-hsig Districts, Kansu Province", p.39.

22 Many archaeologists, including W.A.Fairservis, have in recent years pointed to Kansu as the key to the search for contacts with the Western agricultural Neolithic (See W.A.Fairservis, *The Origins of Oriental Civilisations*, New York, 1964, pp.103-114).

23 B.Allchin, R.Allchin, *The Birth of Indian Civilisation*, London, 1968, pp.158-160.

24 For a description of this complex see I.Khlopin, "The Rise of Cattle-Breeding and Social Division of Labour in Primitive Society", *The Leninist Teaching in the Study of the History of Primitive Society, Slavery and Feudalism*, Moscow, 1970 (in Russian).

25 On Chia-chia see Kuo Teh-yung, "Report on Excavations at the Huang-niang-niang-t'ai Site, Wu-wei District, Kansu Province", *K'ao-ku hsüeh-pao*, 1960, No.25; M.Bylin-Altchin, "Chi-chia-ping and Lo-han-tang", *Bulletin of the Museum of Far Eastern Antiquities*, Stockholm, 1946, No.18.

26 San-li-chiao II (Miao-ti-kou yü San-li-ch'iao) can serve as an example of a developed Honan Lung Shan site, while Ko-sheng-chuan II is regarded as a standard of Shensi Lungshang (*Feng-hsi Fa-ch'u pao-kao*, Peking, 1962).

27 Yang Tzu-fan, Wang Ssu-li, "The Lung-shan Culture", *K'ao-ku*, 1963, No.7.

28 About these cultures see Chin Hsüeh-shan, "A Report on the 1958-1961 Excavations in Yün-hsien and Chün-hsien Districts, Ho-pei Province", *K'ao-ku*, 1961, No.10; *Ching-shan Chü-chia-ling*, Peking, 1965; Yin Huan-chang and others, "A Report on Excavations at the Ta-tun-tzu Site near Ssu-hu-chen, P'ei-hsien District, Kiangsu Province", *K'ao-ku hsüeh-pao*, 1964, No.2; J.M.Treistman, "Ch'ü-chia-ling and the Early Cultures of the Hanshui Valley, China", *Asian Perspectives*, 1970, Vol.XI.

29 See T'ang Yün-ming, "Similarity of the Ceramic Articles of Lung Shan and Yin", *Wen-wu ts'an-kao tzu-liao*, 1958, No.6, pp.67-69; Chang Kwang-chih, Op. cit., 2nd ed., p.236 (table).

30 See H.Barnard, *Bronze Casting and Bronze Alloys in Ancient China*, Tokyo, 1961, pp.59, 108, etc.

31 See L.Aitchison, *A History of Metals*, Vol.I, London, 1960.

32 See M.Loehr, *Chinese Bronze Age Weapons*, Ann-Arbor, 1956, pp.25-32.

33 See P.Kozhin, "On the Problem of the Origin of Yin Chariots", *Culture of the Peoples of Asia and Oceania*, Leningrad, 1969, pp.29-40 (in Russian).

34 The material published in China underscores that the Yins were Mongoloids (see Mao Se-chun, Yan Yin, "Report on the Study of the Teeth of Yins at An-yang and Hueihsiang", *Vertebrata Palasiatica*, 1959, Vol.1, No.2, pp.81-85 and No.4, pp.165-171). However, according to data produced by Li Chi, the Yins were strongly brachycephalised Mongoloids, which markedly distinguishes them from the Yang-shao and Lung Shan people (see Li Chi, "Importance of the An-yang Discoveries in Prefacing Known Chinese History with a New Chapter", *Proceedings of the Eighth Pacific Science Congress*, Vol.I, S.1, 1955, pp. 433-434).

35 R.de Lacouperie, *Western Origin of the Early Chinese Civilisation*, London, 1894, pp.9-10; H.Cordier, *Histoire générale de la Chine*, Vol.I, Paris, 1920, pp.33-34; L.de Saussure, "Le système cosmologique sino-iranien", *Journal Asiatique*, Vol.202, 1923; M.Hashimoto, *Über die astronomische Zeiteinteilung im alten China*, Tokyo, 1943; J.Needham, Op.cit, Vol.II, Cambridge, 1956, p.354.,

36 Kuo Mo-jo, Op.cit.

37 C.Ball's analysis made it possible to determine 21 identical and many similar symbols, although in some cases this similarity may be regarded as accidental (C.J.Ball, *Chinese and Sumerians*, London, 1913).

38 See B.Karlgren, "Grammata Serica", *BMFEA*, Stockholm, 1940, No.12; "Grammata Serica Recensa", *BMFEA*, Stockholm, 1957, No.29.

39 See E.G.Pulleyblank, "Chinese and Indo-Europeans", *Journal of the Royal Asiatic Society*, 1966, pp.1-2; J.Ulenbrook, "Einige Übereistimmungen zwischen dem Chinesischen und den Indogermanischen", *Anthropos*, 1967, Vol.62, No.3-4; J.Ulenbrook, "Zum chinesischen Wort hüe für Blut", *Anthropos*, 1968/69, Vol.63/64, No. 1-2, J.Ulenbrook, "Zum chinesischen Wort ti", *Anthropos*, 1970, Vol.65, No.3-4; T.Ulving, "Indo-European Elements in Chinese?", *Anthropos*, 1968/69, Vol.63/64, No.5-6.

40 See Chen Chia-hsiang, "Report on Excavations at the Shang Lo-ta-miao site in Cheng-chou", *Wen-wu ts'an-kao tzu-liao*, 1957, No.10.

41 See Fang Yu-sheng, "Report on Excavations at Er-li-tou, Yen-shi District, Honan Province", *K'ao-ku*, 1965, No.5.

42 See *Cheng-chou, Er-li-kang*, Peking, 1959.

43 The idea of wandering smiths was first suggested by Childe and Herzfeld (see E.Herzfeld, *Iran in the Ancient East*, London-New York, 1941, pp.157-161). This idea was supported by some Soviet scholars [see *A History of Siberia*, Vol.I, Moscow, 1968, pp.174-179 (in Russian)].

44 See W.A.Fairservis, Op.cit., p.130; L.E.Stover, *The Cultural Ecology of Chinese Civilisation*, New York, 1974, p.43.

Developing Countries: New Researches

Soviet Geographical Studies and Current Problems of the Third World

GALINA SDASYUK, MIKHAIL GORNUNG, GEORGY UTKIN

Soviet geography has rich traditions in Afro-Asian studies. These traditions as well as the constructive experience accumulated in the course of socialist transformations in the USSR are being effectively used in geographical research connected with the pressing development problems of the Third World.

Many important publications on the socio-economic geography of Asia, Africa and Latin America have appeared in the USSR since the last international geographical congress. Soviet geographers studying the countries of these continents are concentrating on such questions as the optimal use of natural resources and its ecological aspects, geographical problems of population and manpower, urbanisation and industrialisation, and problems of economic regions formation.

* * *

The processes of the development of nature and society in their intricate interaction have confronted modern geography and allied sciences with problems of global importance. Constructive elaboration of these problems is especially important for the developing countries. These countries, sometimes called multisectoral (because of the existence of different socio-economic structures) or Third World countries (according to the special place they occupy in the world economic system), are notable not only for the lack of balance

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in the growth of population and production. They are characterised by limited resources of internal accumulation and of trained personnel, sharp regional disproportions in the development of national natural resources and of the productive forces in general.

At the same time, the developing countries differ greatly in size of territories and population densities, natural conditions and combination of resources as well as in the methods of their utilisation.

The territorial (regional) differences between the Third World countries once again underscore the theoretical and practical significance of their geographical research. This research almost inevitably comes into contact with the acute socio-economic problems of these countries.

Thus, the study of the dynamics of their natural environment (for example, the analysis of the causes and after-effects of the disastrous drought in the Sahel natural zone) shows convincingly that the ways and methods of averting undesirable local changes of the environment depend on the specific socio-economic conditions existing in the particular territory. The environmental studies from the point of view of human ecology and conditions for the intensification of economic activities accentuate the close feed-back ties between the environmental conditions and the socio-economic conditions for development.

The mechanism of various natural imbalances in the developing countries is very often to be explained not by natural calamities alone. This mechanism to a great extent depends either on the traditional socio-economic peculiarities of utilisation of natural resources or on the ways of their modernisation. In Africa, for instance, irreversible soil erosion, desertification, and other such natural imbalances take place when agrotechnics are introduced that have been borrowed from other countries with different natural conditions and unadapted to the specifics of the African climate and soil. In many of the densely populated Asian countries the undesirable environmental changes (reduced natural soil fertility, higher floods, etc.) with the traditional agrarian structures of society and primitive agrotechnics maintained, are caused by the rapid growth of the rural, including agricultural, population while the size of the cultivated land remains practically the same. The said changes are also caused by the introduction of Western industrial technology which does not take into account the natural environmental dynamics in the tropics and is insufficiently studied from the point of view of utilisation of the means of modernising the traditional production.

There is a clear connection between the socio-economic types of the developing countries and the economic and ecological processes inherent in them. This fact opens up considerable prospects for realistic forecasting of the dynamics of natural environmental changes that directly affect the conditions of economic development.

The methodological principles expounded in the works of Soviet scholars concerning constructive geography and purposeful transformation of the environment, including their studies of resource cycles, economic appraisal of natural resources, and the natural potential,[1] make it possible to assess in a new way the ecological and economic

aspects of the utilisation of natural resources in arid, semi-arid and humid tropical areas which are most typical of the Third World countries.

The role of the natural resources in their economy, like in the entire world economy, far from decreasing, during the scientific and technological revolution increases. The study of these resources in the developing countries acquires especial significance both as regards meeting the growing requirements of the home market and in connection with world market development trends and export possibilities.

Optimal utilisation of natural resources, however, is to an ever greater extent linked not so much with the level of their economic exploitation as with the standards of the preservation of the general ecological balance in nature, i.e., it is a question of comprehensive consideration of the geographical peculiarities of specific territories, of the need to pass on from the first stage of estimating (inventory) the natural resources to complex ecological, geographical and economic evaluation. This evaluation reveals additional and new possibilities of using the natural resources potential (i.e., all kinds of natural resources — biological, water, climatic, mineral, etc.) in order to accelerate the process of overcoming the general economic backwardness.

The geographical aspect of the study of the natural resources potential is especially important for the countries whose economic structure was deformed by colonialism. After-effects of the one-sided economic orientation are noticeable in most of these countries even today. Their natural resources potential is still quite often seen, by force of inertia, through the distorting mirror of the colonial past. At the same time the natural pre-conditions for the development of new trends in agriculture, for mastering specific power resources (solar, geothermic, etc.) as well as utilisation of favourable conditions for setting up recreational and balneological centres and zones of world significance, are often left out of sight.

Experience shows that consideration of the natural resources factor for regional planning in the developing countries yields good results if and when this factor is understood as the complex of the natural conditions and natural resources needed for creating favourable living conditions for people and for the growth of economic activity. It is not simply a matter of the expansion of the "set" of resources being used but of the planned exploitation of certain spatial combinations of the natural resources complexes.

The effectiveness of such long-term approach to the utilisation of natural resources involves outlays for a new or additional infrastructure, especially when developing the natural resources complexes in areas with extreme natural conditions (deserts, tropical swamps, highlands, etc.). The leading role of geographical science in the rational preparation of such development is obvious.

It can be said that today the manner in which the natural resources problem is being solved in the interests of the maximum satisfaction of national requirements without upsetting ecological standards, is

becoming to a certain extent a touchstone of the socio-economic effectiveness of the whole of long-term planning.

* * *

Soviet scientists have made a study, within the framework of the geography of population, of the pressing problems of the settlement and employment of manpower in the Third World.[2] The study of the spatial structure and dynamics of population is seen as a necessary component of the general scientific foundation of planning in the field of socio-economic development.

For the developing countries geographical analysis of population, the quantitative and qualitative characteristics of manpower are especially significant in general economic estimations, because in the said countries there exist considerable disproportions between the demographic processes and the course of economic development, considerable territorial differences in proportions of the rural and the urban population along with the low level of urbanisation, and a contrasting socio-geographical mosaic of different territories. Interesting in this respect are the typological characteristics worked out by Soviet researchers for separate population areas in the developing countries by combinating demographic, production and economic, and socio-ethnic features.[3]

The works of Soviet specialists covering not only individual countries but also large regions (Southeast Asia, the Andes countries, etc.) have helped to reveal national and regional peculiarities in the structure and dynamics of manpower formation, as well as in the character of their employment in developing countries of different types. Certain prerequisites have been created for further studies aimed at determining the economic requirements of these countries in national trained specialists and skilled labour. The question has been raised of the optimisation, in conditions of the Third World, of the proportions between labour-intensive and labour-saving industries, between factory industry and domestic craft from the point of view of employment and production diversification.

Soviet specialists are also researching ethno-geographical problems of the multinational developing countries.[4] Such research is necessitated by the fact that the process of the formation of nations in the Third World is an intricate one and still incomplete, and by the direct influence of the ethnic processes on the regional types of economy in multisectoral countries. In our view, for many of them, and for the countries of tropical Africa in particular, even a study of the economic and geographical aspects of the tribal system would be most justified.

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Another in the Soviet studies of the complex geographical problems of the developing countries is concerned with the geographical aspects of urbanisation. This trend is prompted by the fact that in

these countries towns are beginning to play an ever greater role and also the fact that the very process of urbanisation, which is proceeding apace, has considerable peculiarities.

The investigations of the current stage of urbanisation in Latin America, carried out by Ya. Mashbits for many years, help to outline some features of this process that are common to most of the developing countries.[5] Thus, the growth rates of the urban population, which are several times higher than the rural population growth rates, are typical of large cities and especially of the largest urban centres. These urban centres exert a strong influence on the spatial redistribution of the population, location of the infrastructure and processing industries, the direction of major migration streams from rural areas and small towns, etc.

Urbanisation in conditions of socio-economic backwardness aggravates many problems. At the same time, however, it results in strengthening inner impulses of socio-economic development by causing the formation of "poles" and "centres of growth" not only in more developed areas, but also, sometimes, in newly-opened up economic areas rich in natural resources.

Systematic studies of the regional aspects of urbanisation are carried on in the USSR with reference to India, the largest of the developing countries. The specific region-forming role of towns in multisectoral countries of a polyethnical type has been analysed in particular.[6] A general comprehensive typology of towns in the developing countries has been worked out on the basis of an empirical selection of the most frequent combinations of typologically important features (27 common types).[7]

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An analysis of major geographical problems in studying the natural resources, manpower, and the specifics of urbanisation in the developing countries is the baseline for considering regional problems of economic development, industrialisation in particular, in these countries. These problems are acquiring increasing significance as a result of the deep-going processes in the social division of labour, including its spatial forms, in conditions of the scientific and technological revolution and the present stage of social transformations in the Third World.

The further elaboration of these problems has been the subject of international studies, including those carried out under the auspices of the United Nations. Most of these studies have been analysed in Soviet literature.[8] Here we should only like to emphasise the marked evolution in the appreciation of the importance of considering the fundamental specifics of the developing countries and their separate groups when tackling problems of locating industrial projects. These specifics exclude a mechanical application of the experience of the industrialisation of old industrial countries and presupposes elabora-

tion of new theoretical and applied approaches to the problems of industrial construction conformably to the specific conditions of the Afro-Asian and Latin American countries.

There is no doubt that the success of the regional industrialisation policy depends on a careful consideration of the typological peculiarities of the developing countries, and, above all, on overcoming their subordinate position in the international capitalist division of labour. Besides, one should bear in mind the diversity of the developing countries themselves, beginning with the largest ones having sufficiently capacious home markets and ending with the less industrially developed small countries.[9]

The regional problems of industrialisation can be considered both within the framework of large regions (continents, subcontinents), i.e., on an interstate level, and within that of individual countries (within the limits of its taxonomic parts — areas), i.e., on the national level. And though the modern world is witnessing a general tendency towards internationalisation of regional economic contacts, studies of regional industrialisation problems on the national level are still of fundamental importance. It is on this level that ultimate decisions are taken, as a rule, on siting this or that industrial project.

In our view, national regional industrialisation problems have two important aspects. On the one hand, the effectiveness of the location of an industrial enterprise is in many ways determined by the possibilities for developing its production-territorial links, i.e., technological and economic complex-formation on different regional (taxonomic) levels. On the other hand, the rates and character of the economic development of an area to a great extent depend on the siting on its territory of industrial enterprises and their combinations, and on the spatial combinations of natural resources and manpower to ensure their functioning and markets for their output. The rational distribution of industrial enterprises should therefore be preceded by a comprehensive analysis and general economic appraisal of the conditions for the interaction of the industrial projects and productive forces of the area, and not only by a narrow consideration of separate factors of the project's siting.

Regional strategy is a specific expression of the general strategy of industrialisation in conformity with the actual socio-economic and natural and geographical conditions prevailing in a given area (region). The economic and geographical studies of regional industrialisation problems on the national level make it possible therefore to elaborate a well-grounded national strategy.

A comprehensive economic and geographical consideration of the regional peculiarities of industrial development and distribution opens up new prospects for making more effective use of investments for industrial construction in different parts of a country. The highest short-term effectiveness of capital investments is usually achieved when the construction takes place in more developed areas strongly gravitating towards large towns and having an infrastructure, skilled manpower, markets, and so on. If, however, the emphasis is on long-term prospects with due account of basic national development

interests, the highest effectiveness of capital can also be achieved by investing in less-developed areas having massive natural resources and other local potentials. A regional analysis is designed to provide the optional variant of distributing a country's resources with due regard for the rational distribution of production and for balanced regional development.

The regional concept of industrialisation in the developing countries cannot ignore the sizes of the industrial objects, their productive capacity, since the levels of their economic effectiveness differ greatly depending on the quantitative parameters of the area they are to serve and of the type of the country's socio-economic development. The great output capacities and narrow specialisation of large modern industrial enterprises, their ramified technological and economic ties make high demands as regards the choice of place for their location — a complicated problem from the point of view of achieving not only economic but also social effectiveness of the project for the development of the area in question and of the entire country. This task often acquires an international character since it has to include an assessment of the role of such an enterprise from the point of view of the cooperation of a number of adjacent countries within the framework of interstate regional cooperation.

These regional tasks of the industrialisation of the developing countries are indicative of the increasing complexity of the territorial-and-industrial structure of production, of the formation of technological and spatial combinations developing sometimes into specific territorial-production complexes. This gives rise to the question regarding the prospects of setting up in less developed areas large industrial enterprises with a view to their subsequent territorial amalgamation with medium-size and small enterprises. This important idea calls for constructive economic and geographical elaboration and fundamental research. We believe that the Soviet concepts of the formation and planning of territorial-production complexes and the method of their modelling can be fruitfully used in this research.[10]

* * *

Regionalisation for planning purposes now occupies a central place in Soviet geographical studies of the Third World countries.

For all their diversity the developing countries have much in common in their sectoral and spatial economic structure which for a long time was shaped by the dominating influence of the inequitable capitalist international division of labour. The main features of the colonial distribution of the forces of production, and of the formation of economic regions in Asia, Africa and Latin America have been shown clearly enough in works by Soviet geographers.[11]

The tasks of economic progress, of overcoming backwardness and ensuring economic independence demand a rapid acceleration of economic development rates and a qualitative change of its nature. This is possible only on the basis of the involvement of all

sectors of the multisectoral economy and of all populated areas in the general process of economic development, of the complex-and regional utilisation of natural and economic resources and manpower, thus creating a unified national economic organism. The developing countries are going through the difficult stage of transforming the sectoral and spatial structure of the economy in the interests of national development. These complicated tasks of reconstruction cannot be carried out by the efforts of the private sector when a market economy predominates. The leading role in accomplishing these tasks must inevitably be played by the state.

The state's influence upon the course of the country's economic development from the spatial point of view (through the siting of major state-run projects and a varied system of measures affecting the distribution of the private sector enterprises — tariffs, taxes, licences, etc.) presupposes regional planning the need for which is recognised in the overwhelming majority of the developing countries.[12]

The economic regionalisation reflecting the objective existence of the economic regions and their development tendencies serves as a scientific basis for regional planning.

Faced with the need to elaborate and solve the complicated problems of regionalisation and regional planning, the developing countries draw on the experience of the more developed countries. In doing so they are naturally interested above all in benefiting not from unique but from universal aspects of this experience, the possibilities of applying this experience to their specific conditions. UN agencies are working to generalise and popularise those aspects of the international experience that could be successfully used in the Third World countries. This work, however, has just begun.

Still widespread is the pragmatic approach, on the one hand, and, on the other, oversimplified identification of the existing administrative-territorial division with economic regionalisation. The original idea to regard regional policy as an organic element of a country's general development strategy is, in fact, usually ignored in the UN publications. Thus, for instance, while considering regional development problems in Asian, African and Latin American countries the essence of the predominant process of the colonial-type spatial structure transformation in the course of attaining economic independence is not defined. Regional planning is seen not as a system but as fragmentary actions in various fields. The problems of regional development are considered without its territorial basis — regionalisation. Left out of account are the primary foundations of regionalisation according to natural resources, which, especially in the developing countries, exerts an extremely strong influence upon the formation of the spatial structure of the economy.[13]

Western economists, for whom studies in the field of regional development are something new, quite often ignore what has been written on regionalisation for planning purposes by a generation of Soviet geographers.[14] And yet the rich Soviet methodological and methodical experience in regional planning accumulated since the

1920s when the State Commission for the Electrification of Russia elaborated its famous plan, can, in our view, be widely drawn upon in the specific conditions of the Third World. Of especial interest today are the principles worked out in the USSR of economic specialisation and production-and-territorial consolidation of areas aimed at increasing labour productivity and strengthening the unity of these countries, the experience of the successful allround advance of the formerly outlying national areas, the principles of the correlation of economic, national and administrative-territorial regions, etc. The first test of Indo-Soviet scientific cooperation in the field of economic regionalisation proves the fruitfulness of joint efforts of this kind.[15]

A number of developing countries have taken the road of non-capitalist development. This creates the prerequisites needed by the state for working out and pursuing a more active regional policy in the field of industrialisation with due account of the above-mentioned principles and wide cooperation with the socialist countries.

The spatial economic structure which has been inherited from colonialism and which took shape in the course of centuries is deep-seated. The process of its transformation is an intricate, dialectically contradictory and long one. The present processes of production and territorial integration are accompanied by tendencies towards autarchy and separatism. The sharp regional disproportions in the levels of socio-economic development inherited from the colonial past are often aggravated by interlacing with the country's national movements and acquiring a political tenor.

Extensive research therefore still lies ahead of scientists into the regularities of the transformation of the colonial type of spatial economic structure as the developing countries advance to economic independence, and in scientifically substantiating their regional development plans which would accelerate their socio-economic progress and overcoming their backwardness.

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The complexity of the problems arising in the developing countries ever more often require interdisciplinary scientific research. Most of the economic, demographic and social situations occurring in these countries cannot be separated from their geographical specifics. Disregard or insufficient knowledge of these specifics dooms many of the investigations into the problems of the Third World's development to practical uselessness.

That is why the study of these problems in the USSR is acquiring an ever more interdisciplinary character and is carried on by specialists in different fields, including the geographical.

Such key problems as, for instance, the activation of the exploitation of natural resources, the formation and development of the territorial structure of production and of the economy as a whole, population distribution and regional development are practically all geographical problems. Soviet geographers have in recent years made

a considerable contribution to the elaboration of the theoretical and methodological approaches to solving, in complex, these and other problems of a socio-economic nature.

At the same time, Soviet geographers are well aware that the further increase of the effectiveness of their fundamental and applied studies concerning the developing countries to a great extent depends also on the development of international cooperation between scientists, on the exchange of experience between experts of various countries.

NOTES

[1] See *Man, Society and Environment*, Moscow, 1975; A. Ryabchikov, *The Changing Face of the Earth*, Moscow, 1975; A. Mints, *Economic Appraisal of Natural Resources*, Moscow, 1972 (in Russian); M. Gornung, *Natural Resources and Prospects of Industrialisation, Industrialisation of Developing Countries*, Moscow, 1973; *Theoretical Foundations of Recreational Geography*, Moscow, 1975 (in Russian); M. Rosin, *Africa's Mineral Resources*, Moscow, 1972 (in Russian); Yu. Dmitriyevsky, *Africa. An Outline of Economic Geography*, Moscow, 1975 (in Russian); *Natural Resources of the Countries of Asia and Northern Africa*, Moscow, 1975.

[2] *Geography of Manpower in Capitalist and Developing Countries*, Moscow, 1971; *Problems of the Utilisation of Natural Resources and Manpower in Developing Countries*, Moscow, 1974; *Geography and Developing Countries*, Moscow, 1973 (all in Russian).

[3] V. Pokshishevsky, *Geography of Population in Foreign Countries*, Moscow, 1971 (in Russian).

[4] *The Countries and Peoples of the East*, Moscow, 1974; O. Olderogge, "Tribe and Commune", *Problems of the Utilisation of Natural Resources and Manpower in Developing Countries;* M. Sakharov, "The Main Tasks of the Ethnogeographical Studies of Developing Countries", *Geography and Developing Countries.*

[5] Ya. Mashbits, "Urbanisation in Latin America," *Urbanisation of the World*, Moscow, 1974 (in Russian).

[6] See L. Bonifatyeva, "Urbanisation and Formation of Economic Regions in India", *Voprosy geografii*, 1968, No.76.

[7] See V. Pokshishevsky, "Typology of Towns in Developing Countries", *Voprosy geografii*, 1974, No.96.

[8] See L. Karpov, G. Sdasyuk, G. Utkin, *The Main Trends and Some Results of the Regional Economic Studies Under the UN Auspices* (An Analytical Review), Moscow, 1973 (in Russian).

[9] See G. Sdasyuk, G. Outkine, "Aspects regionaux de l'industrialisation des pays en voie de développement ." *Problémes de l'industrialisation des pays en voie de développement*, Moscow, 1973; G. Sdasyuk, G. Utkin, "Regional Aspects of Industrialisation", *Industrialisation Problems of Developing Countries*, Moscow, 1973.

[10] See N. Kolossovski, *Théorie de la regionalisation économique*, Moscow, 1975; A. Agenbegyan, N. Bandman, "Modelling of the Formation of Territorial Production Complexes", *Soviet Geographical Studies*, Moscow, 1976; S. Kuzmin, Yu. Lipets, "Problems of Modelling Territorial-Production Complexes in Developing Countries", *Problems of Utilisation of Natural Resources and Manpower in Developing Countries* (in Russian).

[11] See, for example, *Economic and Geographical Problems of African, Asian and Latin American Countries*, Moscow, 1964; *Economic Regionalisation of Developing Countries*, Moscow, 1968; *Problems of Utilisation of Natural Resources and Manpower in Developing Countries* (all in Russian).

[12] See E. Alayev, "Regional Planning in Developing Countries", *Social Sciences*, No.4(18), 1974.

[13] A series of UN publications is analysed in an article by L. Karpov, G. Sdasyuk, G. Utkin entitled "Problems of Regional Development and Planning Abroad", *Economic and Geographical Problems of the Formation of Territorial-Production Complexes in Siberia*, Novosibirsk, 1972 (in Russian)

[14] Economic regionalisation is a major trend in the studies of Soviet scholars. N. Baransky, the founder of Soviet economic geography, and N. Kolosovsky, the author of the theory of energy-production cycles, made outstanding contributions to its development. Hundreds of publications in the USSR are devoted to these problems. A review of these studies is made by V. Pokshishevsky. See his article "On the Soviet Concept of Economic Regionalisation. A Review of Geographical Research in the USSR on the Problems of Economic Regionalisation", *Progress in Geography*, 1974, Vol.7.

[15] See P. Sen Gupta, G. Sdasyuk, *Economic Regionalisation of India: Problems and Approaches*, New Delhi, 1968; *Economic and Socio-Cultural Dimensions of Regionalisation. An Indo-Soviet Collaborative Study*, Delhi, 1972; G. Sdasyuk, G. Utkin, "Regional Development, Planning and Scientific and Technological Progress in the Third World Countries", *The Scientific and Technological Revolution and the Modern Society*, Calcutta, 1970.

A Unique Experiment by Soviet Psychologists

Over a period of many years work has been in progress in the Soviet Union to evolve the ways and means of promoting the all-sided (labour, intellectual, moral, aesthetic and physical) development of people who are totally blind and deaf. Begun in the 1920s by Ivan Sokolyansky, this work was continued by his pupil and follower Alexander Meshcheryakov, who directed an experiment in which a group of blind-deaf-mutes — three young men and a girl — received a higher education.

In 1975 the Academic Council of the Department of Psychology at the Moscow State University, where blind-deaf-mute students are being trained, summed up some general results of that unique experiment.

The following précis of an extended meeting of the Academic Council was written by Doctor of Philosophical Sciences E. Ilyenkov, member of the Editorial Board of the journal *Voprosy filosofii*, and G. Gurgenidze, scientific consultant of the same journal.

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In speech opening the meeting *A. Leontyev*, Member of the Academy of Pedagogical Sciences and Chairman of the Academic Council, formulated the substance of the experiment as follows:

"The specific of the experiment we are considering is that it creates conditions that make the key elements of the formation of a personality, of the formation (just think of it!) of the human consciousness *visible*, I should like to say, even tangible and prolonged in time, as though with the aid of a slow motion camera, conditions that open a window, as it were, on the most sancrosant depths of its nature. Moreover, these extremely rare conditions make it possible to arrive at a correct understanding and evaluation of the relationship between natural prerequisites and the actual state of the being of man, in other words, the real mode of his vital activity. The

latter circumstance makes the experiment important from both the general psychological and philosophical angles. It provides rich material that bears out the Marxist-Leninist theory of cognition, for more than in any other case it clearly demonstrates the link of sense perception and thinking with the foundation that has made and makes man what he is — with labour in the most profound scientific sense of the word, with the process of remaking the nature by social man, a process that alone shapes (and by no means "awakens") that higher form of psyche that is called the human consciousness or, for the sake of brevity, the 'soul'."

"If we are to speak of the formal results of the four-year training of a group of blind-deaf-mutes," said Docent *L. Obukhova*, "we shall find that these results accurately mirror the actual level of acquiring knowledge. In the basic disciplines all four are making good progress, although marks as such neither worry nor interest them. The main thing is their interest in the essence of the matter combined with a keen analytical approach to problems."

Professor *B. Zeigarnik*: "I have to admit that I looked forward to meeting them with great trepidation, for I expected that my course in pathopsychology would encounter considerable difficulties because it usually involves seminars at which patients are shown but my students could neither see nor hear. I was astonished to find that all four blind-and-deaf students were excellently prepared. The questions they asked me were very profound and touched on extremely subtle elements of theory concerning not only and not so much pathopsychology as complex aspects of general psychology."

Professor *G. Andreyeva*: "It seemed to me that the course in social psychology would contain additional difficulties for them. This course, whose content places it on the border of sociology and philosophy, requires an ability to make one's way among a huge mass of facts.

"For example, the debatable problem of the psychological characteristics of large social strata and groups evoked questions from them that were not at all easy to answer. As a matter of fact each of the questions set a theoretical problem. At the exams I was quite amazed at their ability to include in their answers to specific questions considerations of a general order touching upon, if you like, the essence of man's outlook, of his social position."

Docent *N. Rakhmanov*, reader in the history of the CPSU: "I was in a better position than readers in special disciplines — I at once found that before entering the University all four students had been thoroughly trained for the study of socio-political disciplines. They had read many of Lenin's works, including *The Development of Capitalism in Russia* and even *Philosophical Notebooks*. Further, my task was made easier by the circumstance that in the Soviet Union we have considerable socio-political literature printed in Braille, which our students can read without assistance. I must say that the level of their knowledge is not lower but in some areas higher than among students with normal vision and hearing."

Academician *B. Kedrov*: "I tutored a group of blind-and-deafs not under the faculty curriculum but on subjects they were particularly interested in. The most astonishing thing is their insatiable desire for knowledge, their ability to grasp an idea and their wonderful intellectual receptivity. It is a pleasure and a joy to work with them. After a minute or two you forget they do not see or hear you. You even begin to get the impression that they see and hear you better than people with normal vision and hearing. The level of their investigative thinking is now so high and professional that it is our duty to do everything in our power so that in time all four will enter major science."

Doctor of Philosophical Sciences *E. Ilyenkov*: "I must confirm that one can talk with them on complex philosophical subjects on a level that far from every post-graduate student of the Institute of Philosophy has reached.... The depth of their understanding of problems is amazing. Seven years ago, when she was still in the ninth class, Natasha Korneyeva wrote a letter to me in which she asked, and I quote: 'Generally speaking, what is I? It is astonishing and incomprehensible — the body is MINE, the brain is MINE, but where am I myself? What is the relationship between I and the BRAIN?' Try to give an answer that is adequate to the question in sharpness and accuracy."

A. Luria, Member of the USSR Academy of Pedagogical Sciences: "It would be difficult to compare anything with the example of heroism and that summit of success that we see today in the experience of our four comrades.... I would say that the experiment we are considering today is of both huge scientific-intellectual and emotional significance."

T. Vlasova, Director of the Institute of Defectology of the USSR Academy of Pedagogical Sciences: "It seems to me that what we are discussing in the Academic Council today is evidence of the considerable headway made in our country by psychology, pedagogics, and defectology as a component of general pedagogics, as a special branch of knowledge on the laws and specifics of the development of children with all kinds of defects. Higher education is possibly not the direct road for all blind and deaf. But it must be our aim that they receive the maximum education that is given in the country to our people, and that they receive training for labour and for life that would enable them to work with benefit in society and derive complete moral satisfaction from that work."

Professor *M. Lifshits*: "I have had several meetings with the young people, who may be called not only creations of nature but also creations of art — of the noble art of A. Meshcheryakov. These meetings impressed me deeply. First, we have before us a philosophical experiment containing answers to questions that were raised quite sharply by philosophers in the 18th century. Second, this is a remarkable triumph of man over nature. Man returned to these living beings what nature should have but did not give them: he returned to them their human image.

"The spiritual torrent awakened in their minds by the work of the teacher is unusually pure. Deprived of the wealth of direct sensuality, they replace it with the joy of knowledge free of petty day-to-day interests, in fact so free that it calls to mind Plato's and Aristotle's concepts of theoretical contemplation.

"The shortness of my association with A. Meshcheryakov's pupils does not permit me to say definitely whether the spiritual torrent started by him in this environment is pure distilled water free of mineral admixtures and salts or whether there is in it a taste of reality after all. I think the latter is true, for despite the certain artificiality of the environment in which their individuality developed, they did not simply come to life as Pygmalion's marble statue, but rather returned to life, which lies in their nature, and continue to live, entering into contact with the surrounding world on a personal basis reinforced by a pedagogical appliance and education.

"It is noteworthy that Meshcheryakov's pupils do not blame this surrounding world for their misfortune. Rather the opposite. They are cheerful and full of the joy of victory over a disease. All the greater then is the responsibility of the people around them for the future of these young people, who must be especially dear to us."

Professor *A. Leontyev*, who briefly related the history of the experiment and summarised the analysis of the indisputable conclusions drawn from it, drew attention to the need to ascertain how, why and by what means the almost improbable, miraculous result was achieved. He stressed that the "brilliant results of the works of Sokolyansky and Meshcheryakov became possible only through the combination of the finest materialist traditions of Russian science (Sokolyansky began his career as a pupil of Bekhterev and Pavlov) with Marxist-Leninist philosophy, with the dialectic-materialistic understanding of the nature of consciousness and thinking, of their relationship with the external world. No other philosophical concept has or could have given the key to solving the problem of educating and moulding the personality of blind-deaf-mutes either on the theoretical or practical-pedagogical level, so that the very logic of the quest for a solution of the problem brought Sokolyansky round to discarding his earlier mechanistic notions about the psyche and the personality.

"Prior to Sokolyansky's work the world knew of two cases where blind-deaf-mutes were educated. There were two milestones — Laura Bridgman, pupil of the American pedagogue Dr. S. G. Howe, described in detail by Charles Dickens, and the 'miracle of the century' Helen Keller, educated by Anne Sullivan. Although Howe's results were relatively modest (according to Lesgaft, Laura was 'doomed to knitting stockings for the rest of her life'), they astounded contemporaries. A real sensation was caused by the successes in educating Helen Keller, who was given worldwide publicity. She was portrayed (and regarded herself) as a supernatural miracle, a miracle of illumination, after silent darkness, by the strength of the divine Word, by the light of the Logos....

"This interpretation of the phenomenon of Helen Keller accords well with the fundamental ideas of the 20th-century idealist philosophy. The pragmatist William James wrote that the being of Keller indisputably proves the being of God. Clericalism triumphantly took the credit for the phenomenon of Keller. This was all the more easy to do because naive mechanical explanations proved to be clearly untenable. It seemed that the only thing that remained was to acknowledge the presence in man of a spontaneous-spiritual element, which even insignificant external stimuli can awaken and allow it to acquire freedom for 'self-development'.

"This was how the matter was portrayed until a sort of ideological antipode of Keller, Olga Skorokhodova, appeared in the USSR. Her personality and life, a heroic life of labour with no hint of hothouse care, may be regarded as embodying the scientific and moral principles by which Sokolyansky was guided in her education. Like Helen Keller, Olga Skorokhodova is an authoress. She is a writer in the true sense of the word, without any allowance for being blind and deaf. A totally different personality arises from her writings. Those who have read her know that in a fine literary language she writes of the vast and difficult experience of her own observations and reflections of the life around her.* They are not literary reminiscences such as fill the books of the famous American. Olga Skorokhodova's books give the inside story of the complex process of the birth of a soul through hard work — the road along which she was led by Sokolyansky. There were doubts, setbacks and sorrows. But there also was optimism, an optimism of a totally different kind springing up on a totally different foundation. Skorokhodova was a member of the Young Communist League and she experienced the tragedy of the war and the death of comrades (Sokolyansky's boarding-school near Kharkov was burned down by the nazis together with its 'defective inmates' in the summer of 1941, but Olga escaped by a miracle). At first a pupil and then an irreplaceable associate of Sokolyansky and Meshcheryakov, Candidate of Pedagogical Sciences and senior researcher of the Institute of Defectology in Moscow, Olga did much to prepare our young people for life and for study at the University. At present she intends to maintain a thesis for a doctorate. Olga Skorokhodova's personal services have been highly appreciated in the Soviet Union and on her 60th birthday the Government decorated her with the Order of the Red Banner of Labour. She is a true representative of Soviet, socialist culture.

"However, as long as Olga Skorokhodova was the only person who vanquished blind-deaf-muteness in the USSR, her experience could not serve as the final argument in the ideological dispute with the interpreters of the phenomenon of Helen Keller. It is incontrovertible that an experiment may be regarded as scientific only if it can be repeated and reproduced. A unique case is not an argument, for there

* Excerpts from Olga Skorokhodova's *How I Perceive, Imagine and Understand the Surrounding World* were published in the *UNESCO Courier*, March 1974 (note by the Editor of *Social Sciences*).

is always the possibility of shrugging it off saying 'all kinds of things can happen' and thereby attributing success to the individual qualities of a phenomenon, which cannot be of general importance.

"Today one can no longer ignore direct theoretical and philosophical conclusions. We now have not a unique phenomenon but a group of four splendid students. They are not 'Mozarts' but the natural results of the colossal work that has been headed by Meshcheryakov over the past fifteen years. These young people came to us from a boarding-school, where scores of blind-deaf-mute children have received a secondary education, and one can no longer speak of individual 'illumination' or inherent talent."

In confirmation of these words *A. Apraushev*, headmaster of the boarding-school for blind-deaf-mute children in Zagorsk, near Moscow, spoke in detail of the successes that have been achieved in educating more than 50 blind-deaf-mute children of all ages. Twenty of them have started out on jobs and, working at special enterprises run by the All-Russia Society of the Blind, overfulfil their work quota by between 50 and 100 per cent; at the same time, they are continuing their studies at an evening school run by the boarding-school. At sports contests in Zagorsk conducted for the blind, the boarding-school's pupils have occupied 1st place in track-and-field events and cross-country races and 3rd place in skiing. This alone speaks of much, but it is not all. The experiment in training blind-and-deaf at an institution of higher learning is approaching its successful conclusion, while at boarding-school in Zagorsk it is being repeated and reproduced again and again at different age and development levels."

"The materialist traditions laid down by Sokolyansky," *A. Leontyev* continued, "determined the principal road followed by Meshcheryakov. This was a road not of illumination, of extraordinary circumstances and unique cases but of unremitting quests for reasonable possibilities of moulding a mental life in children deprived (or deprived early in life, which does not alter the case) of hearing and vision. The reservation must be made that the loss of vision and hearing at an early age leads to the same results as congenital blind-deafness. In this case the incipient mental life quickly degenerates to zero. Needless to say, the work is based on the maximum use of a child's surviving sensual contacts with the external world, of the entire spectrum of his senses. Above all, these are tactile sensations, then the sense of smell, and vibrational and intraceptive senses. One can add the so-called sixth sense, which, far from being mystical, is of a more complex character and allows, for instance, recognising obstacles, distinguishing open space (an open door) and so on.

"By and large, this foundation is utterly inadequate for the full development of the psyche and creates an extreme deficit of sensual information. This results in a lamentable picture: while the brain is intact there is no association with the surrounding people and, consequently, there is no possibility for study. Even objects of the surrounding world are not initially distinguished, while the senses

coming from the organism itself mix and fuse with external (extraceptive) senses, and there is, therefore, no distinct image of the external world. There is complete helplessness in space and — what is most astonishing — a practical absence of orientation reactions. There are no object requirements — only elementary organic needs, which cannot give rise to any organised and oriented behaviour.

"In this case the psyche — if one can at all speak of the psyche — is totally amorphic, unorganised and chaotic in both the objective and subjective aspects. No stable images crystallise in this torrent of senses.

"In order to use the preserved sources of perception and the development of the psyche it was necessary to find the true foundation of their development. In the long run the pivot of the formation of mental life was found in the process of the formation of action with objects. Here I must make the reservation: human actions with human objects, in other words, with objects created by man for man, the totality of which creates, to use the words of Marx, man's inorganic body. For the blind-deaf-mute child these actions open up the functional properties of objects, i.e., the modes of their utilisation by social man, and he begins to distinguish the objects themselves as things existing separately from each other and from the man acting with them. The child drawn into the 'constructive process', into 'constructive association', as Meshcheryakov liked to say, acquires a human attitude to the external world and to an image of that world.

"Action with objects conducted by the child jointly with and under the direction (here the word must be taken in its true sense) of the teacher becomes the basis for the birth of gestures, i.e., the initial language of association. In the beginning a gesture is a motion made in the absence of its real object (spoon, towel, doll, etc.) and, therefore, it acquires a new function (significance) of a sign, a form of contact with another person — a co-participant in an object action. The gesture is gradually reduced and thereby a natural switch is prepared to an oral (initially dactyl) designation of actions, objects, and the system of designations, i.e., to language in its proper meaning.

"For blind-deaf-mutes the mastering of language opened up fundamentally new horizons of the development of the psyche, of personality, creating new possibilities in sensual-object activity. The secret of the success achieved on this road is that training and education were built up as a process of the gradual conversion of external object actions into internal actions, as the 'interiorisation' of external activity. This equally concerns all forms of activity — intellectual, moral, emotional-aesthetic and all others. Even mimicry is no exception. I remember the plaster cast masks that Sokolyansky used in order to teach blind-deaf-mutes human mimicry. He regarded mimicry as a sort of language, as a means of contact. But while becoming a means of expressing emotions, mimicry strongly influenced the forming of the entire emotional sphere. Here human mimicry humanised the emotional sphere....

"It is hardly necessary to say that the results we are considering today involved colossal, titanic labour. I take this opportunity to

thank not only those who prepared our students for enrolment in an institution of higher learning, but also all those who made it possible to conduct the experiment successfully. I must note the attention that was given our work by the governmental bodies and by the University's Rectorate. We were permitted to accept blind-deaf-mute students *hors concours* but with exams; we were supported in all the considerable expenditures linked with training under these exceptionally difficult conditions. Our students have passed their seventh examination session. There are only one and a half semesters to go, but, properly speaking, the results are already on hand. The time has come to sum up the results to rectify some errors and complete the work. This is no longer a problem — the experiment may be regarded as having come off brilliantly.

"The problem lies elsewhere. Our conference must serve as the beginning of a profound analysis of the essence of the matter, namely the colossal and yet not entirely clear significance of the work conducted by Sokolyansky and Meshcheryakov in all its major aspects — moral, general psychological and general philosophical — to say nothing of the fact that the solution of the problem of blind-deaf-muteness contains extremely instructive facts for the linguist wracking his brain over the problem of the link between language, speech and thinking, for the pedagogue looking for ways of linking intellectual and moral development with labour education, for the student of the psychology of small groups, and for the psychophysiologist studying the link between labour by hand and by brain."

"The experiment conducted by Sokolyansky and Meshcheryakov is the first of its kind in the history of science and the only in the world," said Academician *B. Kedrov*. "During my association with blind-and-deaf students I found that their life, their intellectual biographies give priceless material for understanding creative work, scientific discoveries and inventions, for understanding the problem of human talent. In the life of blind-deaf-mutes virtually every step is a discovery. Our present students should not be passive objects of observation. Already now they are full-fledged participants in an experiment that lays bare the nature of creative work, and it is our duty to provide them with all conditions for joining in major science. If around our young people we manage to form a serious scientific team that would, jointly with them, continue the noble work of Sokolyansky and Meshcheryakov, it would be, I am sure, one of the greatest deeds in the history of human thought.

"During his life-time Meshcheryakov published a superb and profound book, *Blind-Deaf-Mute Children*, but it does not by any means exhaust the material that has been accumulated in the course of decades and continues to accumulate."

Enlarging on the words of Academician Kedrov, Doctor of Philosophical Sciences *E. Ilyenkov* said: "When Maxim Gorky learned of the first successes of Olga Skorokhodova, then a young girl, he regarded them as comparable with the greatest achievements of the human mind in our century, an important step towards the

solution of the task, which for Gorky was central in his own life — the task of the practical assertion of socialist humanism on earth. Neither more nor less. I permit myself to quote:

"'Dear Comrade Skorokhodova, ...For me you are not only the object of a wonderfully successful, scientifically important experiment, not only a vivid proof of the power of the mind exploring the secrets of nature — no!

"'For me you are a symbol, as it were, of the new reality, which is being so quickly and courageously created by our talented working people — workers and peasants. Not very long ago the vast majority of this people, possessing organs of vision, hearing and speech, lived under the unbearable tyranny of the autocracy and capitalism as though they were blind, deaf and dumb. But no sooner did the socialist, scientifically organised mind touch this multimillion and polyglot mass than from its flesh and blood it produced and continuously produces thousands of talented and fearless builders of the new life. You appreciate what that signifies!'[1]

"What was this? Poetic exaggeration by an artist stirred by the unusually dramatic destiny of a girl? By no means. This was a very perspicacious view of a man, who, on account of his long association with Lenin, clearly understood that society's true wealth was determined not by the quantity of things but by the development level of the capability of Man creating these things.

"For that reason he regarded the sphere of upbringing and education with the keen eyes of a Leninist humanist, as the key sphere of production of social life. He clearly understood that this was the sphere of production, within which man, society's main productive force, was created, and that the realisation of this fact separated socialist philosophy from the bourgeois-philistine world outlook. For that reason he regarded the phenomenon of Olga Skorokhodova as being of epoch-making significance. A clear-cut philosophical attitude was what in this case allowed Gorky to display such keen theoretical foresight: to see in the phenomenon of Olga Skorokhodova the long-term prospect that Sokolyansky himself was unable to see at the time. I quote:

"'Dear Olga Ivanovna, ...I made several tries at answering, but felt that I could not rise to the level of the facts, that I could not find the words that would be appropriate and yet discreet. The reason for this is that your letter is a miracle, one of those great miracles which are the achievement of our mind, that freely and fearlessly studies the phenomena of nature, which, while profoundly stirring, evoke confidence in the strength of the mind, in its ability to probe the secrets of life around and within us....

"'It is not always harmful to dream; my friend Vladimir Lenin, the great teacher of the proletariat, upheld the right of dream to become reality and work. And now in dreaming I permit myself to think that perhaps in time epistemology, the theory of the cognition of the world, will become a science like all the other sciences founded on experimentation.'[2]

"Of course — and this seems to me to be axiomatic after what we have seen and heard today — the work conducted by Sokolyansky and Meshcheryakov greatly widens the horizons of our notions not only and not even so much of the possibilities for the development of blind-deaf-mutes as of the intellectual and moral potential in each so-called normal person. In this lies its colossal moral and pedagogical significance for all of us, for our pedagogics, for our school, for the entire sphere of upbringing and education.

"At the same time, it should not be forgotten that blind-deafness is a tragedy and not an entertaining circus performance. But it is an optimistic tragedy, always educating people more fundamentally, staggering them and making them think seriously about themselves, about their lives, about their attitude to life.

"I believe that the factors we are considering today are of similarly colossal significance to theory, in particular, to logic, to the theory of man's cognition of the world, to dialectics in its Leninist understanding. Personally, I have had the good fortune to observe the work of Meshcheryakov and his wonderful pupils for more than ten years and to give them all the help in my power. For me, as a philosopher, this association unquestionably gave much more than hundreds of philosophical works. Indeed, here the secrets of such processes as the formation of thinking, understanding, the strength of judgement are disclosed very clearly and their nature can be seen in the act of their birth. It is difficult to shake off the thought that by itself the sufficiently careful scientific description of facts in their interconnection and sequence has yielded something in the nature of a materialist variant of the Hegelian phenomenology of the spirit.... I am not in the least surprised by the seemingly somewhat unexpected fact that our blind-and-deaf comrades easily master precisely general theoretical concepts, general psychological, general sociological and philosophical categories. This is merely further proof of the truth that such concepts take shape not as abstractions of various individual spheres of scientific knowledge but as active forms of the work of the brain, for which it is sufficient to form a single 'particular' case. If man learns to comport himself reasonably in one case, in one sphere of life and knowledge, he does not have to study scores of other 'examples' to find in his thinking the entire spectrum of definitions of pure (in the present, in the good, and not in the Kantian sense of the word) Reason. Evidently, the same has happened with the concepts of social psychology. The secret is that from early childhood our wonderful young people were drawn by Meshcheryakov into active social life in a complex foreshortening as the struggle for the creation of a study and labour complex for blind-deaf-mutes. That is what made social psychology, i.e., the psyche of the category of people with whom they came into contact, an open book for them....

"We must resolutely disperse the philistine prejudices that have taken shape around the problem of blind-deaf-muteness and been such a strong hindrance during the lifetime of Sokolyansky and Meshcheryakov — chiefly the view that blind-deaf-muteness is no-

thing more than a rare (happily) defectological oddity, an object of pity and scorn, and nothing more. This was the view on which Gorky wrote to Olga Skorokhodova the following wrathful and beautiful words:

"'Dear Olga,... You are sensible. You are right when you say that it is devilishly hard to change the psychology of the philistine, of a man in whose small but capacious soul the stone of age-old banality has caked and hardened. It is difficult to persuade such a person that blind-deaf-muteness is studied, in the final analysis so that he would become less of an idiot. It is difficult to make him understand that he too is deaf, blind and mute, but not because of a wicked 'whim of nature' but as a consequence of his own mediocrity and foolishness.'"[3]

Professor *V. Davydov*, Director of the Institute of Psychology of the USSR Academy of Pedagogical Sciences, dealt with two questions: one linked with the character and role of the genetico-modelling method in psychological research and the other with the nature of thinking.

"Many years have passed since Sokolyansky showed the fundamental possibility of moulding consciousness in blind-deaf-mutes. The repeated reproduction of this experiment in practice, which is the subject of our conference, can and must receive a profound theoretical interpretation, the results of which are of principled significance to psychology as a whole.

"The descriptive method predominated in genetic psychology for many decades. It allowed recording and depicting quite accurately existing, empirically obvious features of the psyche of children at different stages of their development. The data obtained by this method served as the basis for formulating a number of empirical relationships between a child's calender age and the level of his consciousness, his intellectual maturity. Paradoxically enough, the accumulation of such data led to the elucidation of a fairly strange circumstance — to the conclusion that psychical development is not determined by education and upbringing but has its own specific immanent regularities. This conclusion was expressed most vividly and convincingly in the works of the eminent psychologist J. Piaget. It discouraged practical workers. It must be stated frankly that the descriptive method cannot in principle lead to other conclusions.

"Early in the 1930s L. Vygotsky advanced the hypothesis that psychical development proceeds in the form of education. He held that it was possible to ascertain the relationship between development and education by an entirely different method, through the active, purposeful moulding of various psychical qualities in man. Initially, it is expedient to accomplish this process under special experimental conditions modelling the nature of the studied process. Then, when these conditions are known, the corresponding qualities can be moulded in man in the usual environment of his vital activity. The new method was conditionally called 'genetico-modelling'. In the course of many years it did not receive adequate development and

application. The traditional descriptive method sometimes seemed to be sufficient for the usual conditions of the life of a child.

"In psychological thinking this change was particularly sharp in the works of Sokolyansky and Meshcheryakov, who, owing to special circumstances, were able to employ only that method of handling children that was closest to the propositions of the genetico-modelling method. In a deaf-mute child everything has to be moulded at a pre-indicated level — here constructions of the psychical process serve at the same time as the means of shaping the personality and as a means of studying it. In the language now adopted this signifies the unity between experimental education and the study of the nature of psychological processes.

"Innumerable studies of age and pedagogical psychology have now demonstrated the great efficacy of this method. True, many people want to know its specifics. To this the answer is: closely study the works of Sokolyansky and Meshcheryakov. They give the theoretical principles of this method and its specific (technological) features. It is up to historians to judge how the works of Vygotsky are linked with the activities of Sokolyansky and Meshcheryakov. But today it is unquestionable that in both cases we have a substantiation and development of a method that is fundamentally new to psychology and, evidently, most adequate for its experimental purposes. This circumstance requires, on the one hand, a deep-going theoretical analysis and, on the other, the restoration of historical justice. Regrettably, historians of our science have lost sight of the dialectical tradition of the theoretical reproduction of the psyche, the 'I', the 'soul', 'self', by the method that was used by Descartes, Spinoza and later Fichte, without taking which into account it is impossible to understand the modern method of penetrating the mysteries of the 'soul'. Precisely this method is the soul of all of Meshcheryakov's works.

"A mass of literature on thinking has appeared during the past few decades. In this literature there is much that is interesting and instructive, and also much that is not original. In the studies on this theme there is now a tradition that is intrinsically linked with the descriptive method, although formally the authors of these studies state their sympathy for the genetico-modelling method. It seems to me that in his works Meshcheryakov shows that thinking is a form of man's object activity. Moreover, as a mode of such activity thinking is least of all determined by the significance of words and pronouncements. In philosophy as applied to the philogenesis of thinking, these propositions have been established long ago. Positivism and behaviourism alienated experimental psychology for a long time from these materialistic and dialectical traditions. Meshcheryakov's studies returned us to them and showed the ways for their specific experimental psychological elaboration.

"One can speak of many other important aspects of the heritage of Sokolyansky and Meshcheryakov. But I should like to emphasise that their practical pedagogical heritage — which is convincingly expressed in the people educated by them — is of exceptional theoretical

importance and comprises one of the foundations of genuine modern forward-looking psychology."

Professor *L. Naumenko* (Academy of Social Sciences at the CPSU Central Committee): "One of the most remarkable specifics of the experiment is that special tasks linked with the moulding of behaviour, the psyche, thinking and speech in a blind-and-deaf child, in other words, problems of typhlosurdopedagogics, can be raised and resolved principally in general form, as philosophical, methodological and epistemological problems linked with an understanding of the essence, of the general conditions and mechanisms of the formation and development of human capabilities as such. It seems to us that no other logic of raising problems could lead to the results which today stir our imagination. This is clearly seen in the problem of the formation of speech.

"The given problem lay not in the fact that the world of the blind-and-deaf child, the world of things is specific, as specific as the symbols and meaning of his language, but in the fact that a blind-and-deaf child does not accept not only words, which he could have linked with objects but also the objects themselves, shows no interest in them, displays no sign of orientative exploratory activity, and, consequently, that the world of things initially does not exist for him as an object world. For that reason before tackling the problem of linking up 'words and things', the 'meaning of words', a system must be created in which these things would possess a vital meaning for the child, and in which subsequently these meanings would coincide with the 'social meanings' of things as part of human culture and in which the things themselves would be designated only as 'symbols' of activity, objectivised in them and comprising their inner 'contours', their 'semantics', in which, lastly, this inner form of a thing, its 'logic', is translated into the language of object action and turned into a form of activity with it, into intelligent movements of the hands.

"Precisely such a system was evolved by Sokolyansky and Meshcheryakov. This system raises the curtain not only over the mystery of the birth of the psyche but also over the mystery of the birth of language generally. Attention is attracted mainly by the circumstance that in the experiment words are not so much the symbols of things as symbols of activity with them and, what is even more important, as the reduced or 'converted' form of action with things, action arising out of the separation of the 'constructive' activity of the child and adult into functional components and the isolation of these functions.

"In the simplest division of labour between a child and an adult, the actions of the adult, while remaining constructive by their 'natural composition', increasingly become simultaneously communicative, informative, instructive. Executive functions pass more and more into the hands of the child, and regulative functions into the hands of the instructor. The form of activity, its 'logic' is increasingly isolated from its natural, 'constructive', executive composition and is concentrated in the actions of the adult until it turns into a gesture. A

gesture is no longer an action, and neither is it yet a word; it preserves the form of action without its 'substance'.

"The next stage in the 'birth of language' is that becoming separated from a functional motion into a gesture, the form of motion and consequently, the inner form of a thing modelled in activity, its 'sense', is materially separated from activity and takes the shape of a special body, a special substance—the substance of language. For the essence of the matter it is quite indifferent what this substance is—a sound or a movement of the fingers, just as the 'psychical substance' of its embodiment into 'graphic contemplation' is indifferent to the sense substance of the image of things. Activity and the laws of its development, its 'conversion', are what represent the substance of thinking and language that is common for the blind-and-deaf and for people who can see and hear, a substance that is specifically materialised in the natural body of things comprising the object of contemplation and in the natural 'body' of a symbol."

* * *

Blind-and-deaf fourth-year students of the Department of Psychology at Moscow State University Sergei Sirotkin, Alexander Suvorov, Nataliya Korneyeva and Yuri Lerner addressed the Academic Council. Their statements, made by themselves, are given below in an abridged form.

Sergei Sirotkin. In the World of the Blind-Deaf-Mute

1. The images of the surrounding world formed in the mind of every healthy person are living pictures of the real world existing outside the consciousness. In the science of psychology these images are called psychical pictures of the external world or, to put it more scientifically and drily, a psychical reflection of reality.

Without seeing a book before you, you can easily read your own or somebody else's thought in your own mind. When no other person—a comrade, friend or simply interlocutor—is beside you, in your mind you can still clearly hear the familiar voice of the absent person (or your own).... You visualise the smiling, kind face of a beloved friend or of your mother, although these people are now in quite a different place (even in a distant town) and perhaps at this moment they are in a sad mood.... With great pleasure you sail on the sea, waves lap against your face and even salt water fills your mouth.... In actual fact you are listening to a lecture or working at a lathe.

What lovely colours are used to paint these living, psychical pictures of the objective world, which are "seen" as films in your own mind? A normal person (we blind-and-deafs call him one who sees and hears) has five kinds of these colours: visual, auditory, skin-motor, smell and taste (impression). Visual and auditory senses are excluded from the palette of the blind-and-deaf because his visual and auditory analysers do not function.

As a consequence, the blind-and-deaf's psychical picture of the surrounding world is colourless, soundless and, from the standpoint

of one who sees and hears, much more poorly made up. The blind-and-deaf does not see them visually, does not hear them mentally, but feels the imagined with his hands. As you know, colours and visual contours are not accessible to the sense of touch.

The question arises: Does not the "poverty" of the make-up of psychical pictures inevitably restrict the human development of the blind-and-deaf? Is the wealth of human culture, the "world" of one who sees and hears accessible to the blind-and-deaf? Is this world solely the property of one who sees and hears?!

2. A specific of the mental pictures of the real (surrounding) world is their subjectivity. The material for them is not fabric woven at a mill or paints and dyes of different colours and hues produced at a chemical plant. The whole thing is that this material consists of a person's soul (his psyche, to use a scientific term) and its sensual fabric — sensation. In short, man himself (the subject) is the "material" for his own pictures (images) of the real world existing independently of him.

Besides, this unusual material is live and, therefore, subjective. You do not merely "look through" your own pictures (in your mind) but you do with them as your heart wishes. Say, at the wish of your heart you can make an imagined table huge, and in the twinkling of the eye it turns from wood into chocolate or, even better, from an inanimate to an animate object (as in a fairy tale).... You are thereby not simply a viewer and hearer of live pictures (as in a picture gallery or a museum) but, above all, an active participant in a process, in the act of "looking at" and "hearing" all the images and thoughts running through your mind.

Scientific psychology calls this psychical activity, and man (its active participant) is called the subject of this activity. You not only drive a car or operate a lathe, you not only make household utensils or objects of cultural use generally (i.e., engage in practical work). In a similar way you make your soul (psyche) and govern it (accomplish psychical activity).

You are thus the live material of psychical pictures of the surrounding world and the subject (active participant) of your own psychical activity of reflecting reality (the process of "looking at" or "touching" your images, your thoughts).

3. As you can see, the matter is not only in the existence and quality of live material (sensations), of which the psychical image of the surrounding (object) world is built. For the process of portraying (psychical activity, reflection) the real world, the activity of the subject of this activity is of the utmost importance. Images, particularly abstract thoughts (that do not have the external-graphic forms of real objects) do not appear in a person's mind mechanically, as a film projected onto a screen. They must be evoked by the "will" of the heart. In order to be evoked they must be formed in the process of psychical activity (in the same way as objects are made in the process of practical activity).

This is a question of the psychical development of a person (both a normal person and one who is blind-and-deaf). It is a problem of

scientific psychology. This problem is the subject of a heated debate between materialist (particularly Marxist) and idealist (of the most different schools and hues) psychology and philosophy. Idealism asserts that man receives a soul (the psyche) at birth from God. It is only necessary to take it, as a vital document, from the safe by cunning ways of opening that mysterious safe — man. Materialist psychology, on the other hand, considers that the psyche must be created and moulded from the very beginning, in the process of education and upbringing.

This understanding of the nature (origin) of the human soul (psyche) poses both general and special pedagogics before the task of scientifically (correctly substantiated) organising the process of upbringing and education, i.e., moulding and developing a child's psyche.

For pedagogics the central and most difficult task (particularly in work with blind-deaf-mutes) is to shape and foster a child's activity. A child (even a blind-deaf-mute) is not clay in the hands of the pedagogue that can be given any form (personal qualities) without any special effort. He cannot be a simple object of pedagogical influence. In order to make education and upbringing successful, this "clay" — the child — must be turned from an object into the subject of psychical activity, in other words, he must be made active (manifesting even a little, elementary independence in various actions).

In the upbringing and education of blind-deaf-mute children, the pedagogics of Sokolyansky and Meshcheryakov demonstrate the idea of shaping activity in practice. A blind-deaf-mute child will never become a person until he displays elementary independence in the process of actions jointly with the pedagogue (or a specially prepared adult) to satisfy his natural organic requirements (for instance, food, excretory). This is where the entire responsibility devolves on pedagogics: it must not lose sight of the first (even insignificant) manifestations of a child's independence and not suppress them by unnecessary activity of an adult.

4. In order that human forms of behaviour (modes of satisfying needs and requirements) do not by-pass a blind-deaf-mute child, the pedagogue raises them in the form of barriers to the satisfaction of his organic needs, accomplishing these actions (human modes of satisfying needs) jointly with the child, holding, for instance, his hands.

As soon as a blind-deaf-mute child displays the first independent movements in the act of satisfying his requirements, the teacher immediately relaxes his active assistance, i.e., gives him greater freedom. Gradually, the child's activity increases with the proportionate decrease of the activity of the pedagogue.

A child's images of actions are formed and developed in this way. Thanks to these images the child independently accomplishes actions that he had earlier accomplished jointly with the pedagogue. In a way these images gradually replace the pedagogue, and joint actions turn into separate actions. The psyche of a blind-deaf-mute takes shape

and develops in joint separate activity of the child and the pedagogue with the *gradual transfer* of activity from the adult to the child.

A child's language and thinking emerge and develop in this way. In order to evoke independent motions (activity) in a child, it is enough for the pedagogue to begin these motions jointly with him. This is already contact between the pedagogue and the child in the direct sense of the word. It is enough, say, for the pedagogue to touch the leg of a child with pants for the latter to understand that he must pull up his pants.

Lastly, the child's independence develops to the extent that the pedagogue limits himself to showing (imitating) the necessary action (freely) or by indicating the object with which the child must accomplish this action, and the latter accomplishes the action himself. This demonstration of actions or indication of the objects of these actions amount to preoral means (preoral "language") and with their aid the teacher and the child maintain contact in the direct process of separate action.

Then, in the further psychical development of the blind-deaf-mute child these preoral means of contact are replaced with more perfect means, with equivalents of association—words. A transition is effected from the language of gestures to real, oral language. Oral contact opens up a new epoch in the child's psychical development (in other words, pedagogical influence on the child is now effected not only and not so much through direct practical actions as through words).

That is the origin of psychical pictures of the surrounding world—from a person's sensual-practical activity (which is initially represented as jointly separate actions with another person, the teacher, the representative of social culture). Everything generated in the external, jointly separate activity of the child and the pedagogue then passes "into" the child, becomes his psychical processes, his subjective pictures of the external world and is ultimately crystallised in personal qualities.

5. The psyche is formed in this way not only in a blind-deaf-mute child but also in a child with normal vision and hearing. Here the difference is only in the technique of organising pedagogical influence on a child with normal vision and hearing and on a blind-deaf-mute child. This difference is expressed solely in the different quality of the live material of a blind-deaf-mute child and of a child with normal vision and hearing.

The basic material of a person with normal vision and hearing for psychical pictures (comprising his subjective world) consists of his visual and auditory senses. For that reason pedagogical contact with him takes place through the visual-auditory system (which, at the same time, serves as material). Hence the visual-auditory (colour-sound) make-up of psychical pictures of the objective world. In a blind-deaf-mute the psychical pictures of the same world consist of tactile-vibrational material. But this different make-up of images does not distort the objective essence (logic) of the real world.

In her book *How I Perceive, Imagine and Understand the Surrounding World* Olga Skorokhodova gives examples of how a seeing and a blind person perceive a cow. Their perception of a cow is formed by a different hue of senses. But despite the difference in the sensual make-up of the image of a cow, both are well aware that a cow is a domestic horned animal that gives man milk and meat.

A seeing person may give an imagined table any colour, any shape, any artistic make-up, while a blind-deaf-mute may make it warm or cold, rough or smooth.... But neither the person with normal vision and hearing nor the blind-deaf-mute will turn this table upside-down or make its surface soft, for that would go against the essence of a real table, its ability to support vessels, books and so on on its surface, and serve as a work-place.

The community of the psyches (worlds) of the blind-deaf-mute and the person with normal vision and hearing may be judged by the results of their activity, aims and tasks. While acting by different modes and with different means, both achieve the same purpose and obtain the same results (not counting insignificant individual deviations).

Even the emotional state of a person can be determined similarly by a blind-deaf-mute and a man with normal vision and hearing, although they use quite different psychical means. A person with normal vision and hearing sees the mimicry on the face of another person, his posture, and hears the intonational hues of his voice. And he easily understands whether his interlocutor is happy or sad, gay or angry. For his part, the blind-and-deaf establishes this by touching the hand or other part of the body of his interlocutor. A person's emotions are expressed as strongly in the movements of his hands or body, in the "intonations" of dactyl speech and even in a handclasp.

Moreover, both the person with normal vision and hearing and the blind-and-deaf can similarly determine the mood of their interlocutor by tempo of his speech (the tempo of speech frequently changes with the mood of the speaker). For example, a good mood is usually expressed in slightly quickened dactyl speech, a more precise pronunciation of individual letters. The hand of the blind-and-deaf quickly reacts to the least pleasant exclamations (shakes or grips his hand). But when a person is angry his movements usually become sharp, abrupt, uneven. Dactylology becomes not particularly pleasant on account of sharp, abrupt movements. Some people express emotions by movements of the body, for instance, by shrugging their shoulders (this may be felt by a light twitching of the hands), even sharp movements of the head—nodding or shaking—which can also be felt by the recoil in the hands.

Hence the conclusion may be drawn that the sensual make-up of the psyche of a person with normal vision and hearing and a blind-and-deaf cannot be called the essence of their soul. It is only the external form, material, which links with the I (the soul of a person) in the process of psychical development. The nature of the I in a person with normal vision and hearing and a blind-and-deaf is the same—socio-historical; its source is sensual-practical activity.

This was noted by Karl Marx (for instance, in *Theses on Feuerbach*).

6. One can now confidently reply to the above question: sensual-physical limitations — blind-deaf-muteness (discounting serious pathological disturbances of the brain) — do not diminish a blind-deaf-mute's possibilities for psychical development. Here the problem lies not in the possibilities for psychical development but in the pedagogical system of influencing (educating and upbringing) the blind-deaf-mute. This is, essentially, a technical problem (for it concerns only the modes and methods of exercising rational and effective influence on a child, of shaping an integral psyche in him and fostering his activity). This is the only area where the specific of the blind-and-deaf can be seen in comparison with a person with normal vision and hearing. Another purely technical problem is that of creating the technical means and appliances replacing the human eye or ear in the practical activity of the blind-and-deaf. That is all....

As regards the problem of the emergence and development of the human psyche, it is common to blind-deaf-mutes and to persons with normal vision and hearing. In view of the physical limitations and specifics of the pedagogical conditions of educating and upbringing blind-deaf-mutes, the process of the development of a blind-and-deaf is much more striking and extensive, less "littered" with innumerable accidental concurrences of circumstances (that occur in the life of persons with normal vision and hearing).

It may therefore be said that the psychology of the blind-deaf-mutes is the extensive, bared psychology of persons with normal vision and hearing. From this angle the study of the formation and development of the human I in blind-deaf-mutes is of general psychological significance. Here, for instance, it is extremely interesting to trace its rise and correlation with the sensual base, with the body. The philosophical problem of the relationship between the sensual and the rational is resolved in this area.

Thus, provided specific technical problems (pedagogical organisation of upbringing and education, the technical and social compensation for the absence of vision and hearing) are correctly resolved, blind-deaf-mutes may become essentially while not externally persons with normal vision and hearing and full masters of human culture on a par with people with normal vision and hearing!

Alexander Suvorov. Our Study

1. In their studies students with normal vision and hearing use mainly their vision and hearing. On the other hand, we blind-and-deaf students cannot study with the aid of these sense organs. Is it possible for us to study at all?

The answer is yes, but the forms of study must, of course, differ from the forms followed by persons with normal vision and hearing. This means that if we intend to study and not pretend that we are studying, we must study individually, i.e., separately from the usual students. Our difficulties are purely technical. Individual study may be understood simply as the adaptation of the usual mode to out technique. In practice this adaptation to technique takes the following shape. We are not required to attend lectures, seminars and practical

and other classes conducted in the department. There teacher contact with students rests solely on hearing and vision. As far as we are concerned, we can communicate only through dactylology — the finger alphabet. In terms of speed, it is as far from fingers to language as from a car to an aircraft. Tactile perception is even less hurried.

For that reason lectures are taped for us and then written in Braille. Seminars, consultations, tests and exams are organised by teletactor in our living room. (A teletactor is a machine enabling a group of blind-deaf-mutes to communicate simultaneously with any person with normal vision and hearing by means of tactile signals, provided that person is able to use a flat-type or Braille typewriter.) All literature for classes, course and independent study is likewise written in Braille. If we limit ourselves to this it turns out that the individualisation of our study boils down to the adaptation of the usual forms of study to an unusual technique....

2. Like the usual forms of study, our technique leaves much to be desired. These forms are imperfect because they are turned into a physiologically harmless soporific and consign students to boredom. If a person is bored at classes, his study is hardly more effective than writing in the air.

A normal, i.e., psychically healthy person, is bored when he is passive. It goes without saying that outwardly a person may work zealously, give the impression of being superactive, but if as a subject, as an I, he is indifferent to this activity, if he carries out somebody else's will blindly and thoughtlessly as a robot, such a person is passive.

I attended a school for the blind and then the Zagorsk boarding-school for blind-deaf-mutes, and at present I am studying at the Department of Psychology of Moscow State University. I was and still am very interested in the attitude to study of "ordinary" seeing-hearing young people, because at official classes I myself was more often agonisingly bored. I satisfied this interest by asking questions of friends and reading popular-science literature and fiction on pedagogics. I learned that students are called such as a mockery, that it would be more proper to call them learners, i.e., not those who study, but those who are taught....

In modern pedagogics the problem of problems is to turn learners into students, learning into study; to turn the extremely tedious, long years of boring and simply nauseating duty to learn into a genuine need, into an enterprising and creative (and, therefore, extremely interesting and entertaining) activity. True creative study instead of an active passivity in "going through" study material. But how is this to be achieved?

Instead of the teacher's dictatorship there must be the teacher's cooperation with his pupils, students. That, as I see it, is the orientation for looking for the solution to this problem. In our experimental group of blind-and-deaf students all the conditions exist for a quest for the most effective forms of such cooperation. The quest has been proceeding spontaneously, I would say, from the very start of the experiment, and it became purposeful from our third year,

when Lyudmila Obukhova, a clever, kind and wonderfully responsive person, a teacher who is able to listen not only to the study programme but also to the students themselves, became our tutor.

In our third year we concentrated on purely outward individualisation — on the adaptation of usual forms of study to an unusual technique. This problem has been fully resolved. It is time to begin to think — and we have begun to do so — of individualising the internal, i.e., remaking the most imperfect forms of study generated by theory and the practice of "active passivity". This is not of the easiest tasks, but with friends and mentors such as we have, it can be carried out.

3. It has, I should say, become an axiom that a serious and comprehensive study of blind-and-deaf can greatly draw nearer the solution of many key philosophical, psychological and pedagogical problems, including the above problem, which has been raised time and again. It would also seem to be axiomatic that no serious and comprehensive study is possible without a solid material foundation....

Our main problem is to build a training and work centre for blind-deaf-mutes. Whatever you talk about concerning the problem of blind-deaf-muteness, in the end you invariably come to the problem of such a centre. On it now depend the most long-term prospects of typhlosurdotechnics and typhlosurdopedagogics — intermediate sciences that have brought together psychologists, philosophers and pedagogues. Everything possible is being done today. But the main work lies ahead!

Nataliya Korneyeva. At the Sources of the Psyche

We were accepted at the Department of Psychology of Moscow State University not because we had a particularly high level of knowledge compared with others who wanted to enroll, but because they believed in us, believed that science could develop the wealth of the psyche to any level, even if a person did not see and hear. Vygotsky wrote that the psyche is not an endowment but is potentially preset. During the time we have been studying we did not display any super-capabilities, any mythical insight, and this is evidence that the success of our studies at Moscow State University is due not to natural, unmanageable forces but to the achievements of science, which has found the way to mould the human psyche.

Vision and hearing make it possible, without any noticeable effort, to draw from day-to-day practice material for the formation of psychical functions, and this spontaneity and seeming ease in mastering mankind's social experience give birth to the illusion that the psyche is not built up in the course of the study of mankind's cultural achievements but unfolds in accordance with some mysterious laws. Upbringing is called upon to fit the self-developing psyche into an accepted conditional framework, while study has the mission of giving quantitative information about the surrounding world. That this notion is wrong is seen from the example of the education and upbringing of blind-deaf-mutes.

The absence of vision and hearing makes it impossible to obtain information in the usual way and, therefore, to build up the psyche,

i.e., to reflect objective reality actively. The history of the problem of blind-deaf-muteness has shown that a person who loses vision and hearing in childhood cannot break down the wall separating him from the world, that he cannot independently find the way to "unfold" his psyche. The very fact that this way was found for him from outside and is not an "illumination" of the blind-deaf-mute himself is evidence that the psyche is a cognisable thing, that it can be built up, controlled and guided. How is the psyche to be built up?

In *Blind-Deaf-Mute Children* Meshcheryakov writes: "Mastering a thing, i.e., learning directly to satisfy his requirements, a child assimilates (and appropriates) social meaning, converting it into a personal sense. Social meaning cannot be assimilated without action, for only the practical use of a thing as a means of achieving an aim reveals its designation. What makes a child act?"

Meshcheryakov describes a case where a girl lost her vision and hearing at an early age, and clumsy treatment suppressed her striving for communication and independence, and fostered a negative attitude to acts of care and feeding. Why strive for anything when everything is being done for you incomprehensively and forcibly, without noticing and suppressing timid attempts to say something? As a result, the girl lived a vegetative life. She began to assimilate the social meaning of things only when she was taught to eat with a spoon. At first the spoon was tippled in the mouth, and as soon as the least activity by the girl was noted — seizure of food with the upper lip — the spoon was no longer tippled to give the child the opportunity to take part in the act of taking food. Then the spoon was not put in the mouth, but only allowed to touch the lips. The child had to open her mouth herself and take the food. The child's activity increased in proportion to the decrease in the activity of the adult, whose actions gradually passed to the child. Parallel with this the child's hand was placed in the hand of the adult so that the child could get her bearings in her movements to take food with a spoon, then the spoon was placed in her hand and she was taught to eat independently.

The adult feeds and dresses the child with his hands and closely watches for the appearance of the first attempts on the part of the child to help, carefully encouraging this striving — this is the beginning of the creation of the psyche. By assimilating the habit of serving himself, by learning how to act with objects, the child receives the material on the basis of which his perception, attention, memory, understanding of the environment and attitude to people develop. At the same time, this condition for further development — assimilation of the action with the spoon — allows forming the gesture to express the desire to eat. This is an act, isolated from the object, having no material result and turned into a word. The child can now be told to do something, praised, criticised or forbidden. From gestures it is necessary to go over to dactyl speech as quickly as possible, for words allow mastering the highest forms of knowledge.

Naturally, not everything in psychical development goes smoothly. It is still difficult to foresee and competently give shape to the entire wealth of the human psyche. Yet there are unbounded

possibilities and an insistent need for studying it. A report by A. Belova and L. Maryina, teachers at the Zagorsk school for blind-deaf-mute children, on the development of small children, gives an example of how a boy named Alyosha refused to learn dactylology. When the teacher showed him a dactylem he shook his head, closed his eyes and hid his hands behind his back. This difficulty was overcome by turning the process of assimilating dactylology into a game. Psychologically this was a correct decision. In a game a child easily assimilates, in the form of a game, what he does not accept in the form of study as alien and forced upon him for no reason at all. This fact shows that development, a strictly determined whole, does not accept what it cannot assimilate. In a game the child still does not have sufficient motivation for study as such, which does not rely on guidance, does not foster but only collects fragmentary skills.

Every aspect of a child's development must be followed with the closest attention so that nothing is missed in the complex arsenal of the psyche and the conditions are opportunely created for the development of various of its components. A blind-deaf-mute cannot compensate for the teacher's shortcomings through outside information. In practice these conditions are created on the basis of empirical experience. A child assimilates culture with the aid of vision and hearing, and this considerably enlarges his sphere of activity as compared with blind-deaf-mute children. But there is often no control over how he has mastered and then assimilated the psychological aspect of social experience, and a success or a failure of upbringing is explained by hereditary merits or shortcomings, the environment, and so on; but the fact of the matter is that the child has to be helped to master mankind's grandiose achievements not only on the material plane but also on the plane of the make-up of his psyche. Some teachers and parents have that talent, others do not. In order to prevent children being crippled by the burden of this task, psychical development that has for ages been allowed to drift, must be placed under scientific control.

Take the example of a group of small children who are taken out for a walk. They have learned how to serve themselves and understand simple gestures, but they do not as yet have active contact. Purposeful activity must be organised with them, for instance, by scattering snow to allow it to melt faster. The children are given shovels, but for them they are not yet implements of labour, only new objects which they can manipulate, drag along the ground or spin. They are shown how to take the snow on the shovel and throw it on the dark asphalt; they enter into the novel motion with pleasure. But then the observer begins to worry that the children are trying to get closer to each other, placing themselves in danger of being hit with a comrade's shovel in the zeal of the moment. They are made to stand farther apart from each other. They resist. But they submit under the threat of being left without a shovel. What is the matter here? Perhaps they feel that a comrade's snow is better? Attentive observation allowed assuming that here the matter was in the motivations of actions. At first the child was attracted by the novelty of the action,

but this motivation soon faded, and he began to manipulate the shovel, abandoning purposeful activity, for he did not yet have the motivation to work for the common good. A child loses all interest in working alone, all the familiar manipulations with the shovel have been made, and the assistance of the adult demonstrating purposeful actions is accepted submissively and negatively, as something imposed and incomprehensible. It is quite another matter to look and act as other children. But since their vision is weak they huddle together. The extent to which joint work attracted them may be gauged by the fact that after long work the children did not want to give up their shovels.

It may be assumed that this case slightly raised the curtain on the formation of an attitude to collective work. If for fear of injury to the children they were deprived of the possibility of joint work giving them the possibility of observing, imitating and thus becoming infected with the desire to work together, and made to carry out purposeful actions without the appropriate motivation, their attitude to this sort of labour would undoubtedly have been negative. But does this hold true only of blind-deaf-mutes? In the given situation this regularity was accentuated among blind-deaf-mute children, but in the case of children with normal vision and hearing it would have been obscured. We by no means claim to discover this regularity. This is how collective activity is usually organised in kindergartens, but there the collective spirit is fostered on the basis of vision and hearing—distantly, the necessary motivations are stimulated by life. It is, however, imperative that they must be known. Life does not always conscientiously arrange everything for the better, and it is time to place it under scientific control.

Scientific observations show that while teaching a blind-deaf-mute child human modes of existence we evoke and develop a potentially preset psyche. Consequently, instruction must be understood not as quantitative information about the environment that the child must remember but as mediated influence on the child's development with the aid of this information. The important thing is not how much information the child memorises but how that information serves to mould his notions, convictions and skills. Unfortunately, we have observed blind-deaf-mutes who assimilated a large volume of educational information, wrote grammatically and could answer any question in the curriculum, but their range of interests remained narrow and their moral concepts and mode of association remained primitive. This is frequently the case among normal pupils but it is more difficult to grasp the situation there.

From learning how to serve oneself to gestures, and from gestures to dactyl speech, to reading and writing. The mastering of speech leads to the development of thinking, contact and knowledge. A systematic structure of consciousness, arbitrary actions and higher forms of intellect develop, and this opens up unbounded scope for the development of blind-deaf-mutes. Many of them have completed their studies at the Zagorsk Boarding-School for Blind-Deaf-Mute Children

and are successfully working at educational-production enterprises for the blind, while four had the good fortune to study at the Department of Psychology of Moscow State University. This was not an accidental choice. Having found the happiness of breaking out of isolation, out of a pitiful, dependent existence, which is the lot of blind-deaf-mutes if science does not intervene, and joining in a spiritually rich life, we consider that it is our human duty to make our younger comrades in misfortune happy. Psychology taught us this.

Group instruction of blind-deaf-mutes at an institution of higher learning is something entirely new and difficult to be organised technically. With the aid of vision normal students read printed material, and at lectures and seminars with the aid of hearing they process and systematise this material. We have tried this mode of receiving knowledge, but it proved to be unproductive—it was difficult for the translator to keep pace with the lecturer, and after several hours of classes the sense of the translated text became buried in the efforts to read the dactylems and the desire to change the position of fatigued hands. At seminars it was also difficult—we did not perceive the situation of the moment, and while one thing was being translated for us the class had moved to another. We had to look for other means of receiving the study material, a means that could allow us to process it qualitatively. Lectures began to be taped and then rewritten in Braille. Special psychological literature was also reprinted. And we were able to assimilate the material adequately. The seminars began to be held with the aid of a teletactor. Under these conditions we were able to take our bearings in the various situations, i.e., we heard the teacher and each other. Now we did not merely attend classes but took an active part in them, correcting our understanding of the material, comparing our thoughts with the thoughts of others, and learning to see things and phenomena from scientific positions.

Moral quests proved to be harder for us. During our junior years it seemed to us that we were lagging behind students with normal vision and hearing, that we were studying for the sake of formally passing exams, that we were given higher marks than we deserved. Gradually it became apparent that it was not a matter of comparing us with students with normal vision and hearing or of exams, but that our range of interests began to broaden, that our understanding of our human and civic duty rose to a higher level and that we began to get a scientific world outlook, in other words, we grew qualitatively as personalities.

From the aforesaid it may be seen that the natural channels of receiving information can be replaced by artificial means, that symbols inaccessible to the perception of the blind-and-deaf can be replaced by others, and that the understanding of the social significance of things and phenomena will be adequate. This means that the psyche of the blind-and-deaf develops on the same foundation and by the same laws as the psyche of people with normal vision and hearing.

Yuri Lerner. My Work

I take this opportunity, first, to thank all the teachers who gave so much of their energy to enable us, blind-and-deaf students, to study at the University. Now a few words about my work. Lately I have been much attracted by the problem of the use of aids on educating and upbringing blind-deaf-mute children. I feel that this problem is ranging beyond the framework of the university thesis that I am writing on this subject and that it will become the object of my scientific work....

The most pressing problem of the present must be that of building a training and work centre for blind-deaf-mutes as close to Moscow as possible. This is all the more important in view of the fact that according to rough estimates there are nearly four hundred blind-deaf-mute children in the country and they all cannot be accomodated at the Zagorsk Boarding-School. These children need special education as the air they breathe. Without this they will simply perish psychologically.

This is all I have to say. Thank you again for the enormous assistance you have given us in our studies and for the attention we receive at our University.

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In summing up this sitting of the Academic Council, *V. Stoletov*, President of the USSR Academy of Pedagogical Sciences, said: "This sitting may be regarded as the epilogue of outstanding achievements by Soviet psychologists in their study of the extremely difficult process of the moulding of the human consciousness and, at the same time, as the prologue of new advances in this inexhaustible area of knowledge.

"A. Leontyev has given a profound and vivid picture of the scientific significance of the fundamental researches by Ivan Sokolyansky and Alexander Meshcheryakov. The statements by the students are scientific documents of staggering power. The speeches of scientists assessing the significance of this unique experiment complete the overall picture of this event. The Council is prompting a number of organisational and scientific conclusions. Thousands of teachers are now considering the question of improving the work of the Soviet school. They write in the press, speak at conferences and send letters and reports to the Academy. They are keenly interested also in the problems that were discussed by the Academic Council. The following are some of these problems: What teacher-pupil system can be considered the best under universal secondary education? What stimulates study most strongly and most reliably—the fostering of inquisitiveness and a passion for study, or encouragement and punishment? How is the active thinking of a pupil to be developed? The materials of the Academic Council are of great value to the solution of these problems. These materials must be brought to the notice of schoolteachers.

"Our immediate duty is to propagate the results of this unique experiment. But it is not our only duty. The unique experiment merits continuation, expansion and, naturally, improvement. Consistence, consistence and again consistence is the motto of a true student of nature, society and thinking. This consistence is awaited and demanded of researchers in psychics by millions of teachers. The time has come to set up, within the framework of the Academy of Pedagogical Sciences, a scientific centre that would continue the experiment of Sokolyansky and Meshcheryakov. It would be desirable to group around this centre psychologists, pedagogues, philosophers, in fact everybody interested in an extremely complex and, at the same time, fundamental problem of theoretical psychology, namely, the cognition of the social nature of the human psyche and its formation in the process of pre-school and school education. Evidently, the greater our knowledge of the psyche the more efficiently will we be able to carry out the tasks of modern pedagogics."

NOTES

[1] Maxim Gorky, *Collected Works*, Moscow, Vol. 30, pp. 334-335 (in Russian).
[2] Ibid., pp. 272-273.
[3] Ibid., pp. 433-434.

CRITICAL STUDIES AND COMMENT

Urbanisation in the USA

EVGENY MIKHAILOV

The intricate complex of problems which are nowadays in the USA covered by the concept of the "urban crisis" is reflected in a whole series of "new" theories by American authors.

Some of these authors maintain that all the difficulties of urban life are inevitable problems of growth and are equally characteristic of all developed countries, regardless of the social system. These difficulties will allegedly be eliminated on the basis of the scientific and technological revolution as bourgeois institutions become more developed. For this reason, active measures taken to overcome them, by the state in particular, are, in their opinion, pointless and potentially harmful.[1]

Other authors see modern urbanisation and the large city—the product of this process—as the main evil, against which an active struggle must be waged. These theories conclude that large cities are harmful and unprofitable in themselves.[2]

M. Weber's conception of the "post-urban society" is among those criticising the large city. The author asserts that even the largest cities are becoming too confined for the new urban society and that the broadening of geographical horizons of professional contacts make the modern city and concentration of activities within them an undesirable anachronism.[3]

For all their superficial dissimilarity, these theories are united by the idea that the contradictions and conflicts arising out of contemporary urbanisation in the USA are in no way connected with the nature of capitalism, and that the way out must be sought not in

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refashioning the system itself, but in solving individual difficulties and eliminating their direct causes.

There is nothing new about such views. A hundred years ago Marx and Engels criticised those who, when considering the causes of the degradation of the conditions of urban life, intentionally or unintentionally diverted attention from the main culprit—the social system itself, and this criticism is still both fresh and relevant. Thus, analysing one of the most grave problems of the capitalist city—the housing shortage—Engels wrote in his brilliant work "The Housing Question" which came out in 1872, that the housing shortage is an unavoidable outcome of bourgeois society, that it "can be abolished together with all its effects on health, etc., only if the whole social order from which it springs is fundamentally refashioned".[4]

The claim that capitalism has now changed its social nature under the influence of the scientific and technological revolution and the growing role of state-monopoly capitalism, is refuted by all the negative experience of the contemporary spontaneous and uncontrollable growth of cities, above all in the USA, where problems connected with urbanisation have become extremely acute.

* * *

Urbanisation in the USA both in its early stages (during the period of industrialisation) and at the present time is totally subordinate to society's production and property relations, at the basis of which lies the domination of private ownership of implements and means of production and also of land and immovable property.

This major contradiction results in the contemporary development of the city, including changes in its structure, location of its enterprises and population, remaining subordinate to the interests of the prosperous classes, the bourgeoisie. This is the origin of most of the new contradictions of urban life, which hamper exploitation of the great potential opportunities of urban concentration and of the urban way of life, lead to the decline of the cities and create additional complex and insoluble social problems.

In order to understand the nature of the new contradictions, it is essential to trace the evolution of the city itself and to have a clear idea of its motive forces. The most important of these are, as before, economic.

For many urban plants and enterprises, particularly those involved in material production, the city began to lose its one-time economic attractiveness because of changes in technological processes, the increasingly large space required by industrial premises, and the absence of parking lots and so on. Other causes were the increase in land prices and local taxation, the decrease in the effective demand of the urban population and the deterioration of the social climate in the cities. Industry started to migrate actively to the suburbs.

Without depriving industry of some of the important attributes of the large sity (a supply of varied and skilled personnel, financial institutions, business and professional services), the suburbs provided important economic advantages: an abundance of available and

relatively cheap land, low taxation, on the size of which business was here able to exert a direct influence, better transport accessibility of enterprises, and so on.

Corresponding changes in the location of urban industries over recent years in the USA gave rise to a totally new geography of industrial organisation which, in its turn, exerted an important influence on changes in the geographical settlement of the population. The overcrowded city was replaced by a conurbation of communities or, in North American terminology, by an urbanised (or metropolitan) area covering a wide territory stretching over hundreds of kilometres round the centres and interconnected by production, labour and certain socio-cultural links and contacts. The last US industrial census showed that between 1948 and 1967, 85 per cent of the growth in employment in large metropolitan areas in the USA took place in the surburbs and only 15 per cent in the cities within their old official boundaries.[5] According to other data, between 1960 and 1970, in the suburbs of fifteen large metropolitan areas, 3.1 million employment vacancies arose in all branches of industry and commerce while the old cities of these areas lost 836,000 vacancies over the same period.[6]

Over the last few decades, changes in the location of industrial enterprises in American cities have been accompanied and sometimes preceded by an almost continuous migration of the population, also primarily towards the suburban zones of large cities. A unity of two processes has been observed in population movements in the USA: concentration of the population in cities (true urbanisation) and deconcentration within metropolitan areas (suburbanisation).

At the present time, about 150 million Americans, or about 70 per cent of the population of the country, live in metropolitan areas. Only 45.8 per cent of city dwellers are concentrated in central cities, while the remaining 54.2 per cent live in the suburbs.

Suburbanisation, just like all social processes under capitalism, is a class process taking place in the interests of some social groups and against those of the others. Large groups possessing the necessary means or easily accessible credit for buying their own home and car, left for the suburbs, away from the hurry and scurry and the constantly intensifying problems in the centre. They were motivated not so much by the spatial deconcentration of industry (for, as before, they were usually employed in the business quarters of the centre), as by the search for a favourable physical and social environment. Racial intolerance and also growing fear of riots and urban disturbances, an inevitable consequence of the intensification of the class struggle, also played a significant role.

The law of the market (particularly the housing market) in conjunction with other factors resulted in the poor immigrant and black population continuing to settle in the old city centres, due to the relative cheapness (to the detriment of quality) and availability of old housing and to racial intolerance.

This "separation" of the urban population and new immigrants according to social characteristics, accelerated by the effect of

economic and political levers, is not a new phenomenon in the class society. Capitalist cities have always had their rich and their poor quarters, regions of slums and of luxury mansions.

The specific feature of contemporary development in the USA, brought about by scientific and technological progress and the further intensification of all the contradictions of capitalism, consists in the following.

Whereas the former level of development of means of transportation and communication, of mechanisation in the services, trade and the like, predetermined only the micro-differentiation of urban regions according to social factors, on the level of separate quarters (the dwellings of the rich, medium and poor could be found in almost every quarter, as is now the case in many West European cities), contemporary scientific and technological progress in the USA engendered a macro-scale polarisation of urban society. Territorial demarcation according to social and racial factors was no longer confined to quarters or blocks within them. It spread out far beyond the city boundaries, contrasting the two main socially polarised parts of the present-day extended metropolis—the prosperous and almost exclusively "white" suburbs and the mainly poor and racially mixed city centres. Scientific and technological achievements have helped the prosperous classes to isolate themselves in the suburbs and in essence to create their own new "prestige society", preoccupied with its own interests and almost indifferent to the fate of the old city, left to "stew" in its own problems.

Thus, the worldwide historical process of urbanisation, which is progressive in essence, but is developing on an anachronistic social basis, engendered a phenomenon which has intensified the general crisis of capitalism to an extent that cannot be overestimated. This phenomenon is socio-territorial polarisation, which is splitting urban North America into two societies, separate and unequal.[7]

The socio-territorial polarisation took an even greater hold when it became instituted in the political structure of the local authorities in the suburbs, as reflected in political and administrative autonomy and fragmentation of government. In the pursuit of social isolation, the "suburban" bourgeoisie assured through the state their right to so-called territorial incorporation (self-government or home rule) and full independence from their metropolis. This administrative anarchism itself led to a certain isolation of the central city. It was not an end in itself, however, but simply a mechanism for applying the whole arsenal of means at the disposal of the local authorities to further widen the gulf between the two socially dissociated areas.

These means include both acts of a prohibitive nature, legally confirmed in local ordinances (such as those prohibiting the construction of municipal houses for the poor and for the blacks within most suburbs), and regulating activities in the sphere of zoning, control over the use of free land, supposedly in the public interest, town-planning projects and the establishment of construction and other standards.

Zoning, for example, includes not only control over the use of land falling within the jurisdiction of the given municipality (apportionment of land for housing, industrial premises, recreation zones and so on), but also control over the size of the plot of land for housing or other construction, over the height and size of the building, its external appearance, observance of standards in public utilities and so on. These requirements, as a rule, are deliberately raised, which greatly increases the cost of construction and automatically prevents representatives of the low-income groups from moving into these areas. It is this practice, so deeply class-based in both meaning and content, that explains the fact that 95 per cent of black town dwellers are barricaded within the central cities (and this depends not only on the means level, but also on racial intolerance) and that only 5 per cent live in the suburbs, and even then exclusively in old areas which have been either partially or totally abandoned by the whites. It is also this practice which lies at the basis of the wide gap in income levels between town and suburban dwellers. The largest difference in 1970 was observed between the median family income of the black population in the centres and that of the white population on the urban periphery. This gap, for a family of four, was 5,135 dollars. A significant gap exists also between the incomes of the white and the black populations both within the city centres (3,304 dollars) and in the suburbs (3,539 dollars). This is also characteristic of the concentration of poverty.[8]

* * *

So the main new features which the present stage in the development of capitalist urbanisation has introduced into the life of US cities are an increasing migration to the suburbs, socio-territorial polarisation of urban society and fragmentation of urban government.

As a result, the contemporary American city has become a two-fold and an even more contradictory and socially heterogeneous system than in the past. The latter to an ever greater extent contradicts the objective contemporary requirements of urban development, which emphasises more than ever the social nature of the city itself.

This basic contradiction has manifested itself in the numerous particular problems which American cities are now facing and which, in conjunction with each other, constitute the current urban crisis.

The most serious of these is the complex problem of city centres, which is greatly aggravated by the concentration of poverty there. The old centres with their institutions, administrative structure, financial system and so on, have proved unprepared for the sharp social changes accompanying capitalist urbanisation, and are revealing their increasing inability to cope with the problems that arise. The social degradation of the centres has become one of the powerful factors causing their physical deterioration, the spread of slums, the

formation of ghettoes, of "zones of poverty", these unique underdeveloped regions in the system of urban "colonialism" which is taking shape.

The additional complexity and antagonistic nature of modern urban development consist in the fact that city centres cannot be simply left delimited with welfare status, as, in the opinion of the well-known urbanist D. Steinlieb, American society allegedly decided to do.[9] They are still the focal point of the whole urban economy[10] and a certain, very influential part of the American bourgeoisie is still interested in them. The growth of multi-storey office blocks in the central business quarters is evidence of the fact that the centres have retained a very great magnetic force for the development of certain branches of industry.[11]

This fact determines yet another plane of the social contradictions of US cities. Besides the antagonism between the poor centre and the prosperous suburbs, the city also focuses contradictions within business itself, within the ruling class. Part of this suffers from the decline in the city centres while the other promotes this decline.

This, incidentally, explains the striking and increasingly acute contrasts in the appearance of modern American city centres: shining glass-and-steel skyscrapers, surrounded by a circle of decaying slum dwellings. There is no direct functional connection between these (the inhabitants of the nearby housing areas do not work in the office blocks) and they are antagonistic in class terms.

A series of important economic problems which affect both the private and the public sectors of the urban economy are connected with the new contemporary phenomena in the development of city centres.

The old centres are invested with an enormous capital in the urban infrastructure which provides the basic public utilities of the city—transport, the sewage system, the water and energy supply and the like, and also in commercial buildings and housing. The infrastructural capital alone of the city centres in the USA was estimated in 1971 as being worth 87 thousand million dollars[12]. The amount of capital invested in residential and commercial property can partially be estimated by the sum of mortgages and bonds held by the loan institutions acting as the major financial intermediaries between investors and consumers. In 1970, they jointly held over 65 thousand million dollars of central city residential mortgage debt alone.[13]

The constant physical decline of the centres entails large economic losses, and not only for the financial institutions holding these securities, as their shares fall in price, but also for society as a whole. This is connected namely with the gradual loss of those properties of the urban environment (the most important element of which remains the contemporary urban infrastructure), which are favourable for the development of the most progressive forms of social production and reproduction of labour force in the cities. The degradation of public transport and schools, traffic jams, environmental pollution, obsolescence of the city physical structure and the increasing crime rate entail additional expenditures for enterprises (including some in the

non-material sphere) and individuals which ultimately force them to ignore the advantages of an urban location and move to the suburbs. This migration leads, on the one hand, to a below-capacity utilisation of the urban infrastructure which, in the long run, falls into decay and loses its value, and, on the other hand, to its expensive duplication in suburban areas.[14]

One of the relatively new characteristics of the decline of American cities in recent times is the rapidly growing number of buildings abandoned by owners and inhabitants alike. Hundreds of deserted, but often perfectly sound buildings are an inevitable contemporary feature of the majority of old city areas. According to published data, at the end of 1973 there were approximately nine million[15] housing units in such buildings in the USA (while the average annual construction of housing in the country is about one million housing units).

In a number of large cities this phenomenon has reached threatening proportions. Deserted buildings are a convenient refuge for drug addicts and criminals. Piles of rubbish are growing up around such buildings no longer supervised and becoming breeding grounds for disease and constituting a serious source of pollution of the urban environment.

This phenomenon and also the duplication of the urban infrastructure are manifestations of the wastefulness of the capitalist economy. Something which today may seem unprofitable to the capitalist, is often totally doomed. In connection with the conditions of urban life, this conclusion is particularly relevant at the present time, as the functional ability of the local authorities in US cities is undergoing particularly harsh trials. One of these trials is money starvation, putting the municipal authorities of most old city centres on the verge of bankruptcy.

The financial crisis of the cities consists in a growing gap between constantly rising outlays and the lagging financial resources of the local municipal authorities. This is yet another consequence of the major contradictions of urban development mentioned above. Both the accelerated growth of expenditures in the city centres and the decelerated growth of budget revenues are to a significant degree connected with the concentration of the poor population within them. On the other hand, the well-to-do population with a large tax potential settles beyond the tax jurisdiction of the municipality of city centres, thus depriving it of significant financial support.

The ability of the latter to increase local budget revenues and bring them into accord with outlays is extremely limited. The tax base of the city, which consists of three elements—the value of property (the property tax provides about 60 per cent of all local budget revenues), the volume of trade (sales tax gives 20 per cent of tax revenues) and personal income tax (income tax gives about 15 per cent of revenues)—grows more rapidly in the suburbs than in the city centres, along with the migration of industrial enterprises and the prosperous population to the suburbs and the more rapid growth of trade due to growing purchasing power there. Moreover, an

increasingly large portion of city buildings, public and transport installations, which prove unprofitable for private owners, are becoming municipal property (the metro, hospitals and the like) and are made tax exempt, thereby reducing the tax base of the city and constituting yet another burden on the local budget.

Some US specialists pin their hopes for a way out of the financial starvation on the growth of the non-productive industries in the city, including business, professional and other services, and note the overall growth of employment in these branches in recent times.

From the point of view of the financial self-sufficiency of the cities, this growth, however, provides very little. The change in the economic structure of the centres, their great specialisation in the services brings in certain additional incomes. But these mostly end up in the pockets of those who live and spend these incomes outside the centres. Moreover, the main city property tax is orientated towards the development of capital intensive material production with a high portion of immovable property and it is this which is leaving the cities. Also, the growth of the service industries, which are non-capital intensive by nature, is not "caught" by the traditional tax system in these areas.

The city authorities can only resort to an increase in the rate of taxation. But experience has shown that a growth of the tax burden simply frightens off potential immigrants to the cities and initiates a further flight from them, both of enterprises and of prosperous tax payers, which results in an even greater shrinkage of the tax base. Being in such a hopeless situation, the cities are compelled to cut some of the public services which they offer. In New York, for example, in order to eliminate the current 120 million dollar deficit, thousands of municipal workers were recently made redundant, including police and firemen.[16] This took place in spite of the growing crime rate in the city (a 9 per cent increase for 1973-1974). Both Cleveland and Detroit have resorted to the same method. With the mass unemployment resulting from the economic crisis, such dismissals lay an additional burden on the shoulders of the workers.

Federal and state subsidies to the cities (namely, according to the well-known programme for allocating some federal income for the cities — so-called "revenue-sharing") can partially reduce the gap between revenues and expenditures, but, first, such subsidies constitute only a small part of local budgets[17] and second, they cannot eliminate unemployment, poverty and other social phenomena of city centres — the main source of this gap.

Certain liberal scientists and public figures in the USA see deliverance from the financial crisis in administrative and political amalgamation of cities and suburbs.[18] The problem of so-called "metropolitanism" (from the term metropolitan area, i.e., conurbation) has been discussed for several years in the press. A united administration would be able to amalgamate the tax base and spend budget revenues on the most pressing needs. Such a reform would, in essence, mean the introduction of an additional mechanism for income redistribution activities. It is, however, patently obvious that

in class-divided America, such a measure is not realistic. In reality the cities continue to develop in the diametrically opposite directions, towards even sharper social and political polarisation of urban society, with all its accompanying pernicious consequences.

These consequences include the whole complex of the social ulcers of capitalism concentrated in the cities (unemployment, pauperism, crime, drug addiction, alcoholism, the low level of public sanitation) and new problems of the quality of life, covering both the physical state (pollution) and the social environment (dissociation, alienation, conflicts, riots and so on) and much more.

The growth of crime in the cities which, after a certain insignificant fall between 1971 and 1973, in 1974 again reached a record level gives rise to anxiety in the USA. This is not a question of any special predisposition towards crime of large cities written about by specialists.[19] The geography of crime and, in particular, its increase in large cities and especially in city centres is no more than further evidence of its social nature. It is the areas of physical decay, high congestion, economic instability, bad schools, squalid housing conditions, collapse of the family, and unstable traditions which are at the same time areas with a high rate of crime and other forms of anti-social behaviour.

Crime in the USA, however, is a social evil which respects geographical boundaries less and less. FBI data show that, with an overall growth of 17 per cent in 1974, the rise in crime in the cities averaged 15 per cent, while that in the suburbs was 21 per cent and in the countryside also 21 per cent.[20] If these data are compared with the deterioration in the economic situation in the country, with the continuing migration of the prosperous classes to the suburbs and with the especially rapid growth of crimes against property (by 20 per cent), the reasons for the rising crime rate in the suburbs become even more obvious. The decaying cities and the increasing poverty of the urban population are becoming a less fruitful field for criminal activities, especially crimes against property.

The growth of crime in the suburbs results in the ugly but already widespread practice of encircling individual communities with high stone walls and barbed wire, i.e., turning them into virtual fortresses, thus fencing off the "flourishing" American even more completely from the alien and hostile social environment.

One direct consequence of the contradictions in the development of American cities is the problem of the quality of schooling and, more specifically, that of integration of schools and busing, which has recently once more assumed a sharply political character in connection with the much-talked-of disorders in Boston.

In the USA, schools are financed out of local budgets. The financial crisis is itself an important cause of the low quality of schooling in the cities. But however sharp the difference might be between the finances of city and suburban schools,[21] of enormous importance for successful acquisition of knowledge in schools and for overcoming the existing educational barrier between blacks and whites in the USA is the direct family and school environment in

which children live and study. In this sense, the socio-territorial polarisation of urban society has played an especially negative role in the fate of schools. The departure of the white population to the suburbs led not only to the formation of negro ghettoes, but also assisted segregation in city schools and considerably lowered the quality of the school environment. The schoolchildren learn the lesson of segregation right from childhood.

The poor quality and low effectiveness of schooling in segregated schools simply intensify the social and racial inequality in the country and make prospects of overcoming it even more remote.

* * *

Since, in general, urbanisation leads to concentration of people[22] and industry, it is potentially connected with the possibility of excessive congestion and upset of the "ecological balance". By creating the danger of exhaustion of natural resources, of threatening degradation of the quality of the environment, urbanisation implies a relative decrease in man's communion with nature and increase in the role of the man-made environment in his life. With more complex forms of labour, this leads to an ever increasing artificiality of the very separation of the environmental factors from the production ones and increases expenditures on the city, turning one of its major components—the environment—from what was at one time a "free gift" of nature, into an object of social production.

Contemporary urbanisation puts the problem of the urban environment rather differently. Under present-day conditions, it has acquired a two-fold character. Its traditional aspect is the ecological problem, i.e., the problem of adjusting the physical conditions of the city for human life, of creating the conditions necessary for maintaining health and supporting the ability to work. This is a question of the urban environment as a living environment.

The other aspect, which is assuming increasing significance at the present time, is the problem of maintenance and development of the urban environment as a favourable "nutrient medium" for the accumulation of the most complex urban functions, for intensification of contacts and social intercourse, exchange of information, development of science, for reproduction of the comprehensive development of the individual.

In a word, social production and the urban environment become increasingly inseparable, a united whole, as urbanisation gains momentum. Everything, including obsolete social relations, that hampers this unity turns into cause of new and increasingly acute contradictions and conflicts.

One serious obstacle to solving the problem of the environment in the USA is constituted by attempts to use the city, with all its favourable opportunities, in the interests of the monopolies alone, in the interests of the bourgeoisie. In spite of its flight to the suburbs the latter continues to use the old centres in its own interests (namely for

the development of office and financial activities), continues to make use of the cultural and public institutions of the city, while ignoring the housing, transport, economic, social, cultural and sanitary requirements of the majority of its inhabitants.

The contradictory nature of urban development is also manifested in the duplication of information flows and informational overloading, and in the rift in social links and contacts, resulting from polarisation. The appearance of the ghettoes, which make the achievements of science and culture inaccesssible for the working people, the deplorable state of city schools already mentioned and the high crime rate—all hamper true optimalisation of the urban environment.

The social contradictions of capitalism have also contributed to the aggravation of the problem of the actual city maintenance.

One classical example of this is the problem of automobilisation. The rapid and spontaneous development of the use of automobiles promoted by the terrifying combined political power of the automobile, petroleum and highway-building industry, has resulted in mutated development of public transportation and has predetermined a serious conflict—the conflict between transport and the city. The most evident signs of this are the extreme congestion in the centres as the city spreads excessively towards the periphery of the conurbation, pollution of the atmosphere, further physical decline of the city and deterioration of living conditions.

The uncontrolled use of automobiles, in assisting the decline of public transport, has seriously exacerbated the problem of movement within the cities. For millions of Americans who, for some reason or another, do not use automobiles (their numbers have recently grown as a result of the energy crisis), the "monopoly" of autotransport has resulted in many of the cultural economic and social advantages of life in the city proving unattainable and therefore pointless, while, at the same time, the deterioration in environmental conditions (overcrowding, pollution, fear for one s personal safety) have made the life of the city dweller particularly difficult.

The spread of the city, a process which was to no small extent facilitated by the automobile, itself led to a significant increase in commuting distances and rise in the demand for transportation services. The reason for the additional demand is the so-called double "scissors", i.e., concentration in the centres (in offices) of the jobs of those who live in the suburbs, with a simultaneous concentration in the latter (i.e., the suburbs) of the only jobs available in terms of skill for the manpower living in the poor regions in the centres. Moreover, while the prosperous suburban dwellers *do not wish* to live in the centres where they work, the workers of the poor urban areas *cannot* move closer to areas with potentially suitable jobs because of social and racial (including housing) segregation. They are compelled either to spend a disproportionately large share of their income on transport or to doom themselves to unemployment.[23] This is one of the reasons why the level of unemployment in the cities is significantly higher than in the suburbs and even than in agricultural areas. No efficient

public transport exists for transferring the manpower from the city to the suburbs and back. The level of employment and welfare of the poor population of the city centres is heavily dependent on the state of public transport, of which the poor quality and rapidly rising cost are well-known. A certain increase in activity over the last few years towards a greater accent on its development has not yet materialised in any way, due to the overall economic difficulties in which the country finds itself.

Even with a favourable economic situation, the prospects for solving particular problems connected with the city maintenance are totally illusory. One of the additional difficulties is the practically total lack of complex regional planning of city development. I do not mean the almost non-committal recommendations which are included in the so-called general plans, or local laws on the use of land—an instrument of the bourgeois social policy, but scientifically based social intervention in the uncontrolled interaction between private and private group interests concentrating round the city and its economy.

The necessity of effective urban planning grows along with the growth of the cities themselves and with their transformation into economically interconnected and interdependent entities. In these, according to forecasts, most of the population growth in the USA will be distributed in the next few decades. Regional planning is required by many and particularly new functions of the city. The problems of transportation, economic development or the environment cannot be solved separately for the city centre and for each minute community in the suburbs. The very nature of these functions necessitates a single, complex approach to their organisation within fairly large and economically coherent territories.

Current practice, which excludes coordination and in fact encourages the capitalist element, leads to large social expenditures and to an intensification of the crisis of urban life in the USA.

Important material and social losses resulting from the lack of efficient and comprehensive planning are connected in particular with unbridled land speculation in major US cities. Speculators buy up agricultural land on the periphery of cities on the cheap and then hold back in selling this land, waiting for a favourable market situation and the best bargain. Such a withdrawal of land from use in itself reduces the supply and creates an artificial deficit, causing its price to rise. Moreover, land speculation greatly hampers the local authorities in fulfilling city functions and providing essential public services. They constantly come up against the necessity for early or expensive purchases, stagnation and, what is more, limited municipal resources, and so on.

On their part, building companies, when they meet with the high cost and deficit of land, build very expensive houses or, most often, adapt to the market and build houses in the most remote areas of the city periphery, where land prices have not yet risen. This results in a further spread in the metropolitan area and consequently, in an increase in the cost of all urban development.

* * *

Thus, in every aspect of urban life in the United States today that we have touched upon, objective development processes come up against the insuperable and growing anachronism of the production and social relations prevailing there. The capitalist system is becoming a clear and ever growing obstacle to solving the problems that arise, and this is particularly evident in the cities.

So the conclusion drawn by the classics of Marxism that was stated at the beginning of this article remains in force in our times. What is more, the contemporary development of capitalism and its manifestation in the life of the city have justified this conclusion even more and made it even more evident.

NOTES

[1] See, for example, Banfield E., *The Unheavenly City. The Nature and the Future of Our Urban Crisis*, Boston, 1970.

[2] See, for example, Mumford L. *The Urban Prospect*, New York, 1968.

[3] For more detail, see O. Yanitsky, "The Single Post-Industrial Way of Life", *Social Sciences*, No.4.(22), 1975.

[4] K. Marx and F. Engels, *Selected Works*, Moscow, 1969, Vol. 2, p. 327.

[5] See *US Bureau of the Census. Census of Manufacturing*, 1967.

[6] See *New York Times*, October 15, 1972.

[7] The most recent data on social polarisation are presented, in particular, in the book *The Central City Problem and Urban Renewal Policy*, Washington D. C., 1973, pp. 208-217.

[8] See *The Commission on Population Growth and the American Future. Research Report*, Vol. 5, 1972, pp. 468-469. Although poverty is more widespread among the black population of the USA, including that in the cities (one out of three negroes is poor), in comparison with the white (one of ten is poor), three-fifths of the whole poor population of the city centres of the USA are white and only two-fifths are black.

[9] See *US News & World Report*, April 7, 1975, p. 29.

[10] In the 1960s more than half of the gross product in 30 major conurbations in the USA was produced in the city centres. See *Technology Review*, June 1974, p. 38.

[11] See Armstrong R. B., *The Office Industry: Patterns of Growth and Location*, New York, 1972.

[12] See *The Central City Problem and Urban Renewal Policy*, p. 20.

[13] Ibid., p. 305.

[14] *The Commission on Population Growth and the American Future. Research Report*, p. 400.

[15] *US News & World Report*, November 5, 1973, p. 43.

[16] Ibid., April 7, 1975, pp. 29, 36.

[17] The resources transferred to local budgets according to the programme of federal assignments comprise, on average, from 5 to 8 per cent of these budgets.

[18] See, for example, Zimmerman J., *Government of the Metropolis*, New York, 1968.

[19] See Wolfgang M. E. "Urban Crime", *The Metropolitan Enigma*, Garden City, 1970, p. 273.

[20] See *US News & World Report*, April 7, 1975, p. 31.

[21] Federal assistance for schooling also discriminates against state schools in the city centres. These receive significantly fewer average federal resources per head of population and per schoolchild than suburban schools. See Campbell A. K., Ed. *The States and the Urban Crisis*, Englewood Cliffs, 1970, p. 10.

[22] Current forecasts are that by the year 2000, 85 per cent of the country's population will live in cities and 70 per cent in large cities.

[23] Gold N. N., *The Mismatch of Jobs and Low-Income People in Metropolitan Areas and Its Implications for the Central City Poor. The Commission on Population Growth and the American Future, Research Report*, pp. 441-485.

SCIENTIFIC LIFE

COLLECTED WORKS OF MARX AND ENGELS IN ENGLISH

From the Editors: For the first time in the history of book publishing a 50-volume English edition of the *Collected Works* of Marx and Engels has been undertaken. The publication is being carried out on an international basis, as a joint undertaking by three publishers — Progress Publishers (Moscow), Lawrence & Wishart (London) and International Publishers (New York). We have asked the Editor-in-Chief of Progress Publishers, **Yuri Yeremin**, to tell us about this unique edition. Below we print the interview.

Q. How is the English edition of the *Collected Works* of Marx and Engels being put out?

A. The publication of the *Collected Works* has been jointly prepared by three publishers in close collaboration with the Institute of Marxism-Leninism at the CC CPSU in Moscow. Great assistance in the preparation of the English edition has also been rendered by the Institute of Marxism-Leninism at the CC SUPG in Berlin.

The entire work of preparing this edition is controlled by editorial commissions appointed by the publishers in the Soviet Union, Great Britain and the USA. Together they constitute the body that is jointly responsible for the edition as a whole. Final editorial decisions on the respective volumes are made on the basis of mutual consultations by the three editorial commissions.

Q. In what way is the edition a unique one?

A. For the first time publication of the 50 volumes will make available to English-language readers a scholarly and practically complete systematised edition of the works of Marx and Engels, provided with references and notes. Its publication on an international basis will make it possible to take into account and make the most of the results achieved by modern research into the literary legacy of Marx and Engels and the history of Marxism, and of world experience in the publication of scientific literature.

Here it should be noted that the 50-volume edition includes *all* known original writings by Marx and Engels, both those published in their lifetime and those that have reached us in manuscripts, often unfinished. Many works are being translated for the first time into English. Also most of the articles written by Marx and Engels for the British and American press are being republished for the first time. The *Collected Works* will also include abstracts and notes made by Marx and Engels, containing a large number of their own remarks, records of their speeches interviews and other materials.

Besides a General Introduction to the *Collected Works* in the first volume, every volume or group of volumes covering one work is provided with a preface, notes, name, bibliographical and subject indexes. A reference volume for the whole edition is planned.

Q. In what order has the material been planned, what volumes have already appeared and over what period will the edition be issued?

A. This monumental edition has been planned according to three main groups of material. The first includes philosophical, historical, political, economic and other works published in chronological order. The second group consists of Marx's *Capital* with his original variants and writings directly related to it. The third group includes Marx's and Engels's correspondence.

The volumes will, in the main, be published in their numerical order. Two volumes, however, which will include Marx's economic work of 1857-1861 that were not published in full in English, as well as a volume containing the preparatory variants of *Capital* will be published earlier. Parallel with these the volumes of the correspondence will be published.

Volumes 1, 2 and 3 differ somewhat structurally. As is generally known, before Marx and Engels met in August 1844, which marked the beginning of their lifelong and remarkable friendship, each of them developed as a thinker, writer and revolutionary independently. That is why their works in the said volumes are published separately.

Volume 1 contains the works and letters of the young Marx, among them his graduation essay "Reflections of a Young Man on the Choice of a Profession", and his Doctoral Dissertation "Difference Between the Democritean and Epicurean Philosophy of Nature". Volume 2 contains the writings of the young Engels: poetical works, "Letters from Wuppertal", articles from the *Rheinische Zeitung*, philosophic pamphlets and other writings. Volume 3 includes Marx's *Critique of the Hegelian Philosophy of Law*, the *Economic and Philosophic Manuscripts of 1844*, Engels's series of articles "The Condition of England", his "A Contribution to the Critique of Political Economy", and other writings.

Volumes 4 to 26 include the works of Marx and Engels written from the beginning of their creative collaboration. Volumes 4, 5 and 6 contain the works of 1844-1848, *The Holy Family, The Condition of the Working Class in England*, outline of an article on F. List's book *Das nationale System der politischen Oekonomie*, the articles written between 1844 and 1845 are printed in Volume 4. In Volume 5 are the *Theses on Feuerbach, The German Ideology* and the relevant manuscripts, in Volume 6 — *The Poverty of Philosophy, The Manifesto of the Communist Party*, and the articles and documents written in 1845-1848.

The publication of the *Collected Works* will be spaced approximately over a ten-year period. The first five volumes appeared in 1975. The volumes, from 700 to 1000 pages each, with illustrations, are in hard cover and book-jackets. They are printed by the First Model Press in Moscow.

Q. How are the *Collected Works* being distributed?

A. By agreement of the three participating publishers the only distributors of the 50-volume English edition of the said *Works* are: in the USA and Canada — International Publishers; in Great Britain, Australia and New Zealand — Lawrence & Wishart, in other countries of the world — the Soviet trade organisation V/O Mezhdunarodnaya Kniga, which represents Progress Publishers in the world market.

The academic press in a number of countries has commented most favourably on the volumes that have appeared to date. Particular mention is made of the quality of the translation. To fully meet readers's requests additional copies are being printed of the volumes that have already been published. It is also planned to reprint separate volumes periodically.

MULTILATERAL COOPERATION AMONG SOCIALIST COUNTRIES IN SOCIOLOGY

The work of the problems commissions studying the most pressing present-day theoretical problems is a fundamental and promising form of multilateral cooperation between the academies of sciences of the socialist countries in the sphere of the social sciences.

A problems commission consisting of Bulgarian, Czechoslovak, GDR, Hungarian, Polish, Rumanian, and Soviet sociologists was set up in Warsaw in 1974 to study the evolution of the social structure of socialist society, social planning and prognostication. This commission reveals the general laws of the development and changes of socialist society's socio-class structure, and the specifics of these laws in individual socialist countries; works out integral methodological principles for planning and long-term prognostication; studies the socialist way of life and the accumulated experience of Marxist-Leninist sociology in research into social processes.

The following subjects were specified for joint research at the commission's second sitting, which was held in Moscow in June 1975:

1. The working class in the social structure of socialist society;
2. The influence of demographic processes on the development of socialist society's social structure;
3. The intelligentsia in the social structure of socialist society;
4. Education and the social structure;
5. The shaping of the socialist way of life;
6. Planning and forecasting social processes.

The commission decided to prepare and publish joint thematic volumes of papers for the 9th Congress of the International Sociological Association. The precedent for this has been set: a joint Soviet-Polish work on the social structure of society in the Soviet Union and Poland was published for the 8th ISA Congress.

The same sitting considered the paper "Topical Problems of the Changes of the Social Structure of Socialist Society" by M. Rutkevich, Corresponding Member of the USSR Academy of Sciences. Further, it discussed methodological materials — "Standardisation of Sociological Changes" (prepared by the Institute of Philosophy and Sociology of the Polish Academy of Sciences) and "The Social Passport" (prepared by the Institute of Sociological Studies of the USSR Academy of Sciences).

N. Blinov,
Cand. Sc. (Philos.)

POPULATION RESEARCH CENTRE

In 1975 the Population Research Centre of the Moscow State University (Economics Department) marked its 10th anniversary. This experimental centre is engaged in research work, educational, coordinating and publishing activities.

An integrated approach to the study of population problems, and their analysis from broad socio-economic positions is a characteristic of the Centre's research work. Such an approach calls for the cooperation of demographers, economists, sociologists, geographers, historians, medics, mathematicians and other experts. The staff consists of nearly 50 people, including 2 doctors and 20 candidates of sciences. They are headed by D. Valentei, D. Sc. (Econ.).

The Centre incorporates the Population Chair and a problem laboratory which, in turn, is comprised of three sections.

The section concerned with the theory and methodology of integrated analyses of population problems works out the methodological and methodical principles for such analyses of population growth in developed socialist society. The economics of population and socio-demographic evolution section is engaged in establishing the interconnection of the socio-economic and demographic processes. The socio-demographic problems of settlement section is concerned with determining the basic principles governing the formation of population in the various systems of settlement.

In the past 10 years the Centre has carried out 12 socio-demographic surveys in various parts of the country. These surveys have produced rich statistical and factual data for fundamental and applied research.

At present the staff is engaged in working out scientific principles for a long-term comprehensive programme for regulating population growth as an important element of long-term social planning in the USSR.

The Centre combines research with the educational process, thus enriching both of them.

As the Centre's educational department, the Population Chair trains students and post-graduates to become demographers; it also guides the work of trainees from other countries.

During the five-year course of instruction the future demographers study political economy, philosophy, the history of the national economy of the USSR, industrial and agricultural economics, a whole complex of mathematical subjects (mathematical analysis, linear algebra, theory of probability, mathematical programming), modern computing techniques and foreign languages. Over the past 10 years more than 150 demographers have graduated from the Moscow State University. The Chair is also responsible for methodical assistance to the demographic departments in other Soviet universities and economic institutes.

The Centre coordinates the investigation of population problems by Soviet institutes and sponsors scientific conferences, symposiums and seminars.

The associates have published more than 30 monographs and collections of articles, including *The Marxist-Leninist Theory of Population* (currently being translated into French and Italian), *The Principles of the Theory of Population*, and *The Problems of Urbanisation in the USSR*. Since 1973 the Centre jointly with the Statistika Publishers put out the quarterly series *Narodonaseleniye* (Population). In cooperation with the Centre, the "Social Sciences Today" Editorial Board, USSR Academy of Sciences, has published in English, French and Spanish two collections of articles entitled *Population Problems*.

Much attention is devoted to bibliographical information. The Centre has drawn up a basic diagram for the classification of books on demography, it has compiled and continually replenishes a card index of all Soviet and foreign books on population problems that are published in the USSR, and prints bibliographical indexes and information bulletins.

In the past 10 years the Centre has considerably broadened its foreign ties. These contacts take the form of the exchange of lecturers, trainees and books, and of participation in bilateral or multilateral conferences of demographers. It has sponsored two Soviet-Polish seminars on problems of urbanisation.

In September 1975 the Centre provided its facilities for the UN courses for demographers from the developing countries.

The results of the Centre's researches in the past 10 years once again confirm the effectiveness of the comprehensive method in working out urgent scientific problems and the correctness of the main orientation in the scientific and organisational activity of Soviet sociologists—the creation of comprehensive research teams and finding new forms of creative contacts between scientific and educational centres in the country.

T. Smolina,
Scientific Secretary,
Population Research Centre

PEOPLE'S REPUBLIC OF CHINA ANNUAL

As is generally known it is difficult to be well informed of present-day events in China, because of the lack of statistical data from China and the fragmentary information and conflicting reports published in the Chinese press. Therefore the initiative taken by the Institute of the Far East of the USSR Academy of Sciences in publishing an annual devoted to the PRC, is to be welcomed. The aim of this publication is to systematise the main information on the social and economic structure and on the policy of the People's Republic of China, and to analyse the most important events in the life of that country over the year covered. The annual's Editorial Board, headed by M. Sladkovsky, Corresponding Member of the USSR Academy of Sciences, is made up of many distinguished Soviet Sinologists.

The first issue of the annual *People's Republic of China: Political and Economic Development in 1973* was put out in 1975 by the Central Editorial Board of Eastern Literature of the Nauka Publishers (more than 400 pages). Since this collection is the first of a series, it contains articles describing the geography of China, its demographic situation and state structure. A special essay is devoted to Chinese history beginning with 1949 when the People's Republic of China was proclaimed.

In the preface to the annual it is stressed that China has covered a difficult path in the last quarter of a century and that her present internal political situation is characterised by

instability. The regime that was created during the "cultural revolution", it goes on to say, "has revealed its complete inability to ensure a stable further development of Chinese society, to solve the pressing problems of social, economic and cultural construction and to guarantee a steady rise in the standard of living of the Chinese people".

The articles in the collection are grouped into several main sections which are to be retained in future issues: the internal political situation, economics, political parties and public organisations, the national question, foreign policy and international relations, ideology and culture. Each section begins with an analytical review, and the other materials are mostly of a reference character.

Economics hold the central place in the annual. In the articles in this section the determining factors in Peking's present economic policy are analysed, such as the militarisation of the economy, the work and life of the population, the refusal of the government to help non-military industries, the preservation of poverty and the low standard of living of the working people, the purely administrative approach, of dictation in dealing with economic matters, the increasingly smaller use of economic methods to improve the national economy. As a result of this policy, we read in the collection, "two economic systems, two sectors in the national economy, have taken shape in China, which are growing more and more apart from one another — a military and a civil".

In the annual is shown, on extensive specific material, the evolution of Peking's foreign policy, the establishment of great-power chauvinism as the basis of this policy which has inevitably led the Maoists to form a bloc with imperialism and international reaction. The annual notes that "Peking's turnabout to the right determines China's role in world politics today". But, as the authors write, this turnabout has not stopped the process of détente and normalisation of the international climate.

The materials in the concluding section of the collection "Ideology and Culture" make very interesting reading. They show the crisis of Maoism, which is deepening as the struggle for power between rival groups in Peking is intensifying, and the difficult circumstances in which the development of science, culture and education is taking place in the PRC.

The collection is supplied with a map showing the administrative divisions of the PRC and tables showing, in particular, the distribution of various nationalites in the country, and illustrating the development of individual branches of industry and agriculture. There is also a chronology of the major events of the past year.

L. Matveyeva

URBAN ENVIRONMENT

Under an agreement between the USSR Academy of Sciences and the Association of American Geographers, a Soviet-American seminar, "The Environment of the Present-Day and Future Cities", has been set up. Its first session was held in May 1975 in the USSR. The Soviet delegation was headed by Yu. Medvedkov, D.Sc. (Geogr.), the American delegation by Prof. B. Berry, Member of the National Academy of Sciences.

The Seminar's work consisted of two parts — an extensive field programme, and scientific sessions devoted to four themes: the parameterising and modelling of urban environment; the transport network as the basis of the spatial structure of a town; the population's adaptation to the environment and the transformation of the environment in the towns and suburbs; the development of urban territorial systems, nature and the town.

Among the reports made by Soviet specialists were the following: "Integrated Modelling of Urban Environment" by Yu. Medvedkov; "The Principles of Modelling the Noosphere of Urbanised Zones" by Yu. Lipets and N. Chizhov; "Urban Systems and Socio-Ecological Adaptation" by J. Reesma and E. Petrenko; "On the Possibility of Cultural Analysis of Man's Perception of Urban Environment" by A. Levinson.

The American geographers presented three books: Prof. Th. Detwyler's *Urbanisation and Environment,* and Prof. B. Berry's *The Human Consequences of Urbanisation* and *Do Variations in Urban Form Affect Environmental Quality?*

Summing up the results of the discussion, the participants in the Seminar unanimously affirmed the active participation of Soviet geographers in research aimed at rational organisation of the environment in accordance with the existing potentialities of centralised planning in the USSR. Many of their works have a direct bearing on the problems of urban development. The results of theoretical works useful for attracting the attention of researchers to new problems of urban development were also presented. It was noted at the Seminar that in their work Soviet geographers have been cooperating successfully with many representatives of overlapping disciplines (sociologists, mathematicians, biologists, etc.).

Although the social and economic organisation of towns in the USSR differs basically from that of the USA, there are many aspects of the technical (in the broad sense of the word) organisation of urban environment whose comparative study promises important discoveries. The effectiveness of these studies depends largely on the standardisation of methods. Also important are the elaboration of unified methods, the exchange of programmes for computers, and the coordinated testing of models of urban environment which would promote efficient use of the available research experience. The first steps in this direction were made at the Seminar. Its central problem was to prognosticate geographical models of urban communities of the future on the basis of comprehensive elucidation of the history of formation, of the present state and the chief trends of development of the existing cities.

The methods of factor analysis in the modelling of urban environment elaborated by Prof. B. Berry have met with general acknowledgement, found broad application and undergone further development.

The participants in the Seminar adopted a Statement in which the lines of cooperation up till 1980 have been mapped out. Its basic trends are: the ecosystem modelling of cities, the parameterising of human ecology for the study of environmental pollution by choosing the appropriate forms of urban development.

N. Barbash

AN EDITION OF THE WORKS OF GRACCHUS BABEUF

None of the leaders of the 18th-century bourgeois revolution in France — Marat, Robespierre, Danton or Saint-Just — have left any personal archives. Gracchus Babeuf, a predecessor of scientific communism and the leader of the "conspiracy of equals", is the only one to have left large personal archives, which have been quite unexpectedly preserved, despite the fact that he was arrested on six occasions. In the 1870s, the archives fell into the hands of the French collectioner, Pochet-Deroche, and after his death in 1882 were auctioned off and divided up into parts. In the 1920s, after the October Socialist Revolution, the management of the Institute of Marx and Engels in Moscow purchased this most valuable collection from its various owners.

A study of the archives was started in the 1950s and revealed their great importance for a study of Babeuf's biography, especially of the early period of his activity, until 1793. The attention of historians studying the 18th-century revolution in France was universally focused on the very first publication based on these records.

Later on much work was done to bring out all the manuscripts left by Babeuf and also the first editions at archives and libraries in the USSR, France, Italy, the USA and other countries. The results of this work were summed up in the inventory published in Paris under the editorship of A. Soboul, A. Saitta (France), and V. Dalin (USSR). The preparation of a four-volume edition of Babeuf's works was then started. Volume One covers the period from 1779 to 1789; Volume Two — the period from 1790 to 1794, and consists entirely of the Moscow records; Volumes Three and Four cover the period of the Thermidorian reaction and the Directory up until the Vendôme Trial. Volume Four will contain Babeuf's prison letters and his speeches at the trial.

The publication of Babeuf's works in Russian was started by Nauka Publishers in Moscow in 1975. The editors of the Soviet edition include V. Dalin, A. Manfred, O. Senekina and also A. Soboul.

A parallel edition in French will be put out in France.

I. Ivanova

NOBEL LAUREATES IN THE ECONOMIC SCIENCE

The Nobel Prize for the economic sciences, 1975, has been awarded to the Soviet scientist Leonid Kantorovich and the American scientist Tjalling Charles Koopmans for their contribution to the theory of optimal use of resources in the economy.

Academician L. Kantorovich is a founder of the economic-mathematical trend in the USSR. He was awarded the State Prize of the USSR (1949) and the Lenin Prize (1965) for the working out of optimisation models and their application in research on problems of the socialist economy.

Professor T. Koopmans is specialising in mathematical economics.

The next issue of the *Social Sciences* journal will carry Leonid Kantorovich's article "Economic Problems of Scientific and Technological Progress".

Congresses • Conferences • Symposiums

WORLD FORUM OF UNIVERSITIES

In August 1975, Moscow acted host to the 6th General Conference of the International Association of Universities (IAU). The Association's members are 602 universities in 109 countries, including 26 Soviet universities.

The Conference which discussed the problem "Higher Education at the Approach of the Twenty-First Century" was attended by over 1,100 delegates and observers representing 414 universities in 79 countries, as well as various international organisations. The selection of this particular problem for discussion was not accidental. The steadily growing volume of scientific knowledge, the emergence of new sciences at the junction of different spheres of knowledge and the perfection of the methods of scientific analysis dictate the need for a substantial revision of the system of higher education and the training of specialists. In these conditions mastery of the fundamental sciences assumes an ever greater importance for future specialists in all branches. On the other hand, the specialised and applied sciences require to be studied ever more thoroughly. Finally, specialists constantly need additional training since the knowledge acquired at the university rapidly becomes antiquated and needs to be brought up to date.

The Conference received a message of greetings from L. I. Brezhnev, General Secretary of the CC CPSU, which was read by V. Yelutin, Minister of Higher and Secondary Specialised Education of the USSR. In the contemporary world, stated the message, the universities' activities are becoming ever more significant in the economic and social life of every country. They are training highly skilled specialists for all branches of material production and cultural life and are making a weighty contribution to the development of the scientific and technological revolution. However, the fact that the system of higher and other levels of education is not yet adequately developed in a number of countries is causing grave concern. It is the noble mission of universities, stressed the message, to bring knowledge and culture to the people, to actively promote the ideas of peace, democracy and progress.

At the plenary meeting Academician R. Khokhlov, Rector of Moscow State University, delivered a report "Higher Education in the USSR at the Approach of the Twenty-First Century". Contemporary scientific, technical and social progress, said the reporter, has put before society complicated tasks in the fulfilment of which the univer-

sities will play a significant role. Already now the new functions universities will be undertaking in the immediate decades are apparent. As is generally known the educational system of any society is determined by the level of its productive forces, the type of social system, its aims, cultural traditions, etc. The peoples of the USSR are building a communist society in which the overwhelming part of people will have a higher education. The universities' activities will embrace not only the youth; they will become centres of culture and education for the entire people.

The reporter gave a picture of higher education in the USSR which today has 848 higher educational institutions with a student body of 4,8 million, and over 400,000 scientific and pedagogical workers. He dwelt in detail on the tendencies in the development of Soviet higher education in the coming 20-25 years.

In our time — and this will be the case even more so in the future — said R. Khokhlov, considerable changes take place in industry and in other branches of the economy in the 40-45 years of active working life of a the diploma'd specialist. Training should therefore be continuous throughout the specialists' entire working life. What does this entail? First, the need to perfect university instruction. Second, organisation of a systematised "replenishment" of the knowledge of diploma'd specialists working in various spheres of the national economy. Third, closer ties between the universities and branches of the national economy for which personnel is trained. Fourth, universities should cover ever broader sections of the population by their activities which means evolving a diversity of educational forms.

What are the main ways of perfecting the educational process? A more thorough grounding in the fundamental sciences where knowledge becomes obsolete much more slowly than in the concrete disciplines, training students to apply and develop their knowledge creatively. We are introducing, Khokhlov went on to say, humanitarian subjects in the curricula of the natural faculties, for we hold that a narrow professional vision is deleterious not only to the general cultural development of the individual; it also stunts his creative abilities. On the other hand, the curricula of the humanities now include disciplines familiarising the students with the application of quantitative methods in science. The near future will see a further spread of the mathematical sciences in the humanities, in studies on the interaction of man and the biosphere, etc. University instruction will, in the near future, move towards greater individualisation while the mass character of higher education will be preserved. The scientific and technological revolution, the reporter noted in conclusion, sets new tasks before the university in the last quarter of our century. The accomplishment of these tasks will enhance the role of universities in the life of society.

Dr. H. J. Habakhuk, Vice-Chancellor of the University of Oxford, in his report described the state of higher education in Great Britain. He submitted several questions for consideration: the functions of universities, the number of future students, the relation of universities to the state.

After stressing that the main aim of the university is the search for knowledge, for fundamental answers in the basic fields of knowledge and further the development of new industries, the reporter expressed the view that in the future young people will be entering university not only in order to receive a profession, but simply to broaden their own horizons, for example, in the political field or in understanding the essence of the outside world.

Training in the sphere of scientific activity, the speaker noted, naturally implies that it is conducted on the frontiers of knowledge. This knowledge must therefore be up-to-date. Such training is particularly effective if it is carried out on the level of the latest scientific achievements and doubly so if conducted by teachers who are engaged in research and can inspire students with a desire to search for knowledge.

Speaking of the changes in the number of students in the next 25 years Dr. Habakhuk said that expenditures on all kinds of education will increase and this will be a major restriction for those wanting to study. On the other hand, there are factors favouring the growing demand for education: as a country becomes industrialised and per capita incomes increase, an ever larger number of adults will want to continue their education. The demand for education is a very old historical phenomenon but it has acquired new dimensions in recent times. The issue is to give adults the chance to continue their education when they want to and in the form they want to. As regards what should be the universities' relations with the state Dr. Habakhuk holds that they should be independent of the state.

The reports by Academician R. Khokhlov and Dr. H. J. Habakhuk evoked broad discussion at the plenary meetings in which 30 people participated, and especially in the sections.

Two sections were set up at the Conference on "Higher Education and Problems of Economic and Social Development" and "Universities and Innovations within Higher Education".

The first section heard a report "Higher Education and Social Mobility" by Prof. F. Luchaire, President of the University of Paris (Panthéon-Sorbonne). Noting that the question of whether or not the university was a factor of social mobility was a difficult one to answer, the reporter listed three of the difficulties. The first was that universities are not the only institutions which ensure the individual a chance to climb the social ladder. The second difficulty relates to the question of defining what is social mobility. The third difficulty likewise concerns the concept of social mobility, its quantitative aspect. The role of the university, in the sphere of social mobility, Luchaire went on to say, differs from country to country. In the developing countries it is closer to the ideal: there a diploma spells a high salary and a different social status. In Western Europe the influence of universities on social mobility is rather weak.

The reporter noted in conclusion that he thought universities could perform a double function: give an education, thus creating a definite social stratum and preserving the traditions that can and should be preserved; on the other hand, it could widely disseminate knowledge, which is being renewed all the time, to cover all social strata and thus make its contribution to social mobility.

Prof. M. Meyrson, President of the University of Pennsylvania (USA) in his report noted that social mobility is a positive phenomenon and that the more it is encouraged

the better. The question being asked, he said, is whether a higher education was conducive to the further development of social mobility. In the developed countries a higher education increases a person's chances of achieving a fitting position in society. To a greater extent the inequality in receiving a higher education is the consequence of the inequality at the primary and secondary level of education. It is only in those countries which have a system of universal primary and secondary education where there is a real opportunity for the majority to continue their education in a higher educational institution.

Dr. G. Adam, Rector of the University of Budapest, said in his report that in all countries of the world the public is closely following the job placement of young people who have graduated from universities, whether the professions they have chosen correspond to labour power requirements or whether these factors clash with each other. This interest is understandable for the more the personal inclinations of young specialists coincide with the sphere of activity given them by society the more smoothly do they find their place in production, scientific work, teaching and in other spheres of social life.

The socialist countries, the speaker underscored, particularly concern themselves with job placement of young specialists, for one of the key elements of the economy of these countries is the planning of labour power requirements. In accordance with this principle the network of higher educational institutions in Hungary is being expanded and the numerical and professional composition of skilled specialists planned in advance. Dr. Adam noted in conclusion that the system of planning the placement of diploma'd specialists in accordance with social requirements has fully justified itself.

Prof. Fumi Takano, President of the National Federation of Women's Universities of Japan, said that it was necessary to pay closer attention to the youth, to understand their problems and sentiments, and apprehend their views otherwise we will not be able to perform our role of teachers. I would like, she said, that a certain number of students from different parts of the world be invited to IAU's next conference for participation in the discussion.

The second section was addressed by Dr. G. M. Badger, Vice-Chancellor of the University of Adelaide (Australia) whose report was devoted to the needs of research and educational work. It should be remembered, he said, that the main task of universities has always been to provide instruction. But research activity is also important for it influences the level of knowledge. Universities have no place for scientific work which is not at the same time instruction; both these kinds of activity are closely interrelated. In conclusion Dr. Badger noted that some problems cannot be solved within the framework of one discipline or even within the framework of interdisciplines. If these problems are to be solved it is essential to coordinate and unite the methods characteristic of various disciplines in such a way as will make for an integrated approach.

Prof. W. Knopp, Rector of the Wilhelms University of Westphalia at Münster (FRG) in his report dwelt on the connection between research and studies. The fact that a considerable portion of the researches conducted on a national scale is carried out in the university still does not

mean that every independent faculty member must divide his time equally between instruction and research work. This is unrealistic in present conditions. What is necessary is a flexible system with a different emphasis on teaching and on research which will make it possible to use to best advantage the efforts of faculty members with due account of the abilities and inclinations of each. In general, universities have always played a significant role in fundamental researches and will continue to do so in the future. Special attention should be paid, the reporter said in conclusion, to providing research with the necessary organisational and financial basis.

Academician S. Belyaev, Rector of the University of Novosibirsk, in his report spoke of the role of the University in training cadres for science. The scientific and technological revolution of the 20th century, noted the reporter, called for a dynamic and correlated development of three of its main elements: production, science, education. University education is aimed entirely at training scientific workers capable of tackling the fundamental and applied sciences, of grasping new technological ideas. The advantage of a university education lies also in the potential possibility to "scout out" social requirements, to reorganise the educational process in accordance with the demands made of the university specialists being trained by the latest scientific and production trends.

S. Belyaev then went on to tell how instruction in the University of Novosibirsk was organised. The University's basic principles, he stressed, are: early involvement of the youth in independent research; rational employment of the personnel and material resources of the Novosibirsk Science Centre of the Siberian Branch of the USSR Academy of Sciences; preliminary training of school youth for the University and enrolment on merits. The University of Novosibirsk widely enlists leading scientists who are actively engaged in research and head various research teams.

The work of the General Conference of the IAU proceeded in an atmosphere of cooperation and mutual understanding. At the closing plenary meeting the Association's leading body, the Administrative Board was elected as well as the Association's new President, Dr. Roger Gaudry (Canada) and Vice-Presidents — Academician R. Khokhlov (USSR) and Dr. K. L. Shrimali (India).

E. Pinchukov,
Deputy Editor-in-Chief,
Vestnik vysshei shkoly journal

THE FIRST RUSSIAN REVOLUTION

In June 1975 Tbilisi was the venue of an all-Union scientific session devoted to the 70th anniversary of the first Russian revolution. The session was sponsored by the USSR Academy of Sciences' Scientific Council for the integrated study of the problem "History of the Great October Socialist Revolution", and its Georgian section, by the Institute of History of the USSR, USSR Academy of Sciences, the Institute of the History of the Party under the Central Committee of the Communist Party of Georgia (a branch of the Institute of Marxism-Leninism under

the CC CPSU), and the I. Djavakhishvili Institute of History, Archaeology and Ethnography of the Academy of Sciences of the Georgian SSR.

More than 200 historians representing leading research and university centres in various republics of the Soviet Union took part in the work of the session, as well as historians from Bulgaria, Czechoslovakia, Hungary, the GDR, Mongolia, Poland and Rumania.

The participants heard five main reports and more than 50 communications. A. Kosulnikov, D.Sc. (Hist.), devoted his report to Lenin's analysis of the character and driving forces of the 1905-1907 Revolution and its historic lessons. According to Lenin, it was the first peoples' anti-imperialist revolution in which the proletariat became the leading force, under the leadership of the Bolshevik Party, which rallied around it all revolutionary and democratic forces. The new alignment of class forces created a real possibility for the bourgeois-democratic revolution developing into a socialist revolution. This conclusion by Lenin was of the greatest theoretical and practical importance.

The report "The Proletariat — the Hegemonic Force in the First Russian Revolution" by V. Bovykin, D. Sc.(Hist.), dealt with the socio-economic and political factors which ensured the leading role of the working class. The communications on this problem — one of the most topical ones in the present-day ideological battle — showed that the Russian working class retained the hegemony it had won in the course of the 1905-1907 Revolution in all the subsequent stages of the revolutionary movement.

In his report "The Historiography of the 1905-1907 Revolution: Results of Study and Tasks of Research", Academician A. Narochnitsky outlined further areas of investigation into the subject.

Contemporary bourgeois historiography of the three Russian revolutions was the theme of a report by V. Salov, D.Sc.(Hist.). He subjected to a critical analysis the main concepts in this area — the thesis about the "primordial backwardness" of Russia and the so-called "modernisation" theory. The reporter has showed that both are aimed at distorting the ideas of Leninism and at discrediting the historical experience of the revolutionary movement in Russia.

Considerable attention at the session was devoted to the international significance of the first Russian revolution. In his report on the subject, Academician I. Mints noted that the influence of the revolution did not end with spurring the revolutionary movement in many countries of the world (in both the East and the West). It manifested itself also in the fact that much of its experience and its principal regularities, discovered by Lenin, were later repeated in the world revolutionary movement.

Foreign scholars cited new data on the impact the ideas of Leninism and the revolutionary practice of 1905-1907 had on the working-class and national liberation movement in many countries of Europe and Asia, on the international solidarity of the working people of the whole world with revolutionary Russia. Great interest was aroused in particular by the reports of V. Khadjinikolov, Corresponding Member of the Academy of Sciences of Bulgaria — "Some Aspects of the Influence of the First Russian Revolution in Bulgaria", W. Ruge — "The Importance of Lenin's Analysis of the 1905-1907 Russian Revolution for German History", F. Mucsi — "The First Russian Revolution and the Hungarian Working-Class Movement", I. Sirzea — "Solidarity of the Working-Class Movement in Rumania with the Russian Revolution of 1905-1907", J. Sobczak — "Cooperation of the Social-Democrats of the Kingdom of Poland and Lithuania with the RSDLP in the First Russian Revolution", W. Bortnowski — "The Revolution of 1905-1907 in the Polish Lands", O. Kodedowa — "The Influence of the First Russian Revolution on the Working-Class Movement in the Czech Lands", Sh. Sandag — "The Influence of the 1905-1907 Revolution on the National Liberation Movement in Mongolia".

A number of communications examined the revolution of 1905-1907 as political schooling for the Bolshevik party. The experience and lessons of this revolution, generalised by Lenin, enriched the Party theoretically and strengthened it organisationally. This circumstance was a decisive factor in the achievement of a complete victory by the proletariat and the poorest peasantry in October 1917.

Much attention was devoted to the establishment and development of the alliance of the working class with the peasantry and other non-proletarian, petty-bourgeois strata both in the central and outlying national areas of the country. The reports on the work of the Bolsheviks in the army evoked keen interest.

Historians from the Union and autonomous republics analysed various aspects in the history of the revolutionary-democratic trend in the national liberation movement which became an integral component of the Russian revolution.

G. Ioffe,
Cand. Sc. (Hist.)

PROBLEMS OF EQUALITY AND FREEDOM

In August 1975 St. Louis (USA) was the venue of a congress sponsored by the International Association for Philosophy of Law and Social Philosophy, one of the oldest international scientific organisations (founded in 1909). About 300 scholars from 48 countries took part in the Congress whose theme was: "Equality and Freedom: Past, Present and Future".

The following problems were discussed at plenary meetings: "The Correlation Between the Goals of Equality and Freedom", "Scientific Manipulation of Behaviour and Legal Protection of Freedom", "Equality Among Nations", "New Legal Institutions for New Social Relations". Besides the plenary meetings a symposium was held on the subject "Fundamental Perspectives of Equality and Freedom" which heard two reports: "The American Revolution as a World Experiment: European and American Roots", by the American historian A. Bestor, and "Equality and Freedom in International Jurisprudence", by J.E.S. Fawcett of Great Britain.

In their reports the delegates from the USSR and other socialist countries stressed that an analysis of the concepts of equality and freedom should be approached from concrete positions, should be based on the socio-economic and political system

of society, and that freedom and equality should be guaranteed not only legally but also socially. The ideas of freedom and equality are realised in the consolidation and continued progress of the socialist system, in the uplifting of the working people's material and cultural standards, in the expansion of socialist democracy.

Characteristic of most of the reports by scholars from the capitalist countries, on the other hand, was their formal approach to the problems of equality and freedom: the tendency was to view them outside the context of the social and economic system of society, to bypass examination of concrete facts of political, social, racial and national discrimination and the inequality between men and women. A number of papers (S. Shuman, USA; S. Dando, Japan; A. Diemer, FRG) showed the stamp of the ideas of genetic engineering.

Discussion was particularly keen in the group sessions which dealt with the problems: "Persons", "Property", "Anticipation: Environment and Natural Resources", "Participation", "Anticipation: Information Science and Human Relationships". In their reports scholars from the capitalist countries spoke of the individual's worsening legal position in the conditions of the scientific and technological revolution, and his increasing subordination to the state (P. Foriers, Belgium; W Kilian, FRG; C. Köllner, Sweden). Scholars from socialist countries noted the accordance of socialism's political system with the requirements of the STR, the latter's positive influence on the broadening of the democratic rights and freedoms of citizens and the reinforcement of the guarantees of these rights and freedoms by the state (B. Topornin, USSR; V. Peschka, Hungary).

The reports by the Soviet scholars D. Kerimov, "Individual Freedom and Social Activity", and V. Shevtsov, "Principles of Cooperation in the Relations Between the Citizen and the Socialist State" evoked a lively discussion. The facts cited on the active participation of citizens in public activities, on their relations of cooperation and mutual support conclusively refuted the idea that participation is an overestimated and unpractical ideal.

In their interpretation of property most of the representatives of non-Marxist conceptions hold that it is a "natural" right, inherent in the individual because of his biological nature and that it is the basis of his personal freedom. In his report V. Laptev (USSR) characterised property as a social phenomenon, especially property in the means of production. M. P. Weyl of France shared this view which she discussed at length in her paper.

The question of personal property under socialism attracted wide attention. Ch. Perelman (Belgium) tried to prove that personal property under socialism and private property under capitalism were one and the same thing. This viewpoint met with sharp criticism on the part of scientists from the socialist countries, in particular W. Weichelt (GDR), who showed that personal property under socialism is property in articles of consumption, that it derives from public property, whereas private property is the basis of the exploitation of man by man.

In their papers on the economic, social and legal status of citizens in contemporary society the representatives from the capitalist countries as a rule did not relate these issues to a certain social group, to a socio-

economic social system (A. Basave, Mexico; J. Charnay, France; V. Held, USA; M. Yasaki, Japan). The lawyers from socialist countries aimed to give a concrete analysis of the legal status of the individual in their countries by showing its broad and guaranteed basis. They stressed in their papers that Marxism's negation of bourgeois law does not mean the negation of law in general. The entire practice of socialism shows the constantly growing role of socialist law as one of great social value (A. Shebanov, USSR; M. Borucka-Arctowa, Poland; K. Mollhau, GDR).

Despite the fundamental differences in the approach to legal and social phenomena, in the interpretation of the nature of these phenomena, the discussion by lawyers from countries with different socio-economic systems was very useful. The strengthening of détente in the international arena undoubtedly conduced to the calm, businesslike atmosphere in which ideological problems were discussed that are of concern to scholars of all countries and continents.

Gray Dorsey, a professor at Washington University, St. Louis, was elected President of the International Association for Philosophy of Law and Social Philosophy. Academician D. Kerimov of the Azerbaijan Academy of Sciences, and a Corresponding Member of the USSR Academy of Sciences, was elected one of the Association's four Vice-Presidents.

A. Shebanov,
D. Sc. (Law)

LOGIC, METHODOLOGY AND PHILOSOPHY OF SCIENCE

The Fifth International Congress of Logic, Methodology and Philosophy of Science took place from August 27 through September 2, 1975, in London, Ontario, Canada. The Congress was sponsored by the Division of Logic, Methodology and Philosophy of Science of the International Union of History and Philosophy of Science. The Congress agenda was worked out by the International Programme Committee chaired by Prof. J. Hintikka (Finland). The organisation of the Congress in Canada was handled by the Local Organising Committee (Chairman — Prof. R. E. Butts).

Some 500 scientists from 25 countries took part in the Congress. The most representive delegations were those from the USA — about 200 people, Canada — approximately 80 people, the USSR — 34 (the delegation was headed by Academician B. Kedrov), the FRG — 25, Great Britain and the Netherlands — 20 people each, and France — 10 people. The fact that the Congress was held so far away from Europe prevented a large number of European scientists who occupy a prominent place in this field of knowledge from participating.

The Congress programme was discussed at 12 sections and two intersectional symposiums. At each section the Programme Committee invited four to eight prominent scientists to give a one-hour or half-hour invited address or to take part in the intersectional symposiums. All in all, 80 invited papers were read, 30 by scientists from the USA, 17 from the USSR, five each from Poland, Canada and the FRG, four each from Finland and Great

Britain and three by specialists from the Netherlands. In addition, contributed papers which had been previously published were presented at each section for discussion, but were not read at the Congress. Soviet specialists presented more than 50 such papers; a considerable number of the contributed papers were submitted by specialists from other socialist countries (Czechoslovakia, Poland, Rumania, the GDR, Bulgaria).

The programme was so extensive and many-sided that we believe it will continue to attract the close attention and evaluation of specialists for a long time to come. Of the most significant events at the Congress we note the following.

Amongst the numerous questions of mathematical logic, the foundations of mathematical theories and the computability theory raised at the Congress (these questions were discussed by the first three sections) the following were of particular interest: the analysis of the results of the elaboration of a constructive model theory (Yu. Ershov, USSR); research into the axiomatic questions of large cardinals (R. Solovay, USA); a description of new approaches in theoretical programming (E. Engeler, Switzerland) and algorithmic logic (A. Salwicki, Poland); an account of the latest results of research into abstract structures (Y. Moschovakis, USA). In his report A. Markov (USSR) gave an overall account of his method of staircase semantical systems in constructive mathematical logic. G. Sacks (USA) in his paper raised the question of the general recursion theory. Yu. Matijasevič (USSR) showed in his report that the well-known four colour problem can be reduced to the task of cut elimination in certain logical calculus. A detailed analysis of the present state of the category theory, one of the intensively developing fields of mathematics today, was given at a special symposium on the category theory (S. Feferman and W. Lawvere, USA, and others).

The invited papers read at the sections of the philosophy of logic, general methodology of science and the foundations of induction, may be regarded as defining the most pressing problems of the present stage in working out the logic and methodology of science. In particular, the Congress showed that the logical analysis of science change and development which has been intensively discussed in literature over the last decade, is continuing to attract the attention of specialists. The possible ways of making a logical analysis of the revolutions in science were dealt with in an interesting discussion at the Congress between J. Sneed (FRG), W. Stegmüller (FRG), and T. Kuhn (USA).

In the papers and reports by Soviet philosophers, and also by Marxists from other countries, the neopositivistic and postpositivistic variants of logic of science were subjected to sharp criticism. A number of Western scholars drew attention to the essentially limited nature of the Popperian methodology of science. New approaches to the working out of the logic of empirical theories were proposed in the papers by R. Wojcicki (Poland), and M. Popovich (USSR). E. Agazzi (Italy) dealt with the correlation of the subjectivity, objectivity and ontological commitment in empirical sciences. The paper by C. Hooker (Canada) was devoted to the determination of the place of methodology in the philosophy of science. The application of the theory of induction to statistical explanations and the

truthlikeness of generalisations was examined by W. Salmon (USA) and I. Niiniluoto (Finland). Modern concepts of the philosophy of logic, in particular J. Hintikka's theory of possible worlds, were subjected to analysis at the symposium on the philosophy of logic, in which D. Kaplan (USA), I. Hacking (USA) and V. Tselishchev (USSR) participated.

Methodological questions of physics, biology, psychology, linguistics and social sciences were dealt with at the sittings of the respective sections at the Congress. The fact that Soviet specialists were invited to as main speakers at these sections is an indication of the considerable progress made in the USSR in working out these problems. In their reports M. Omelyanovsky and S. Melyukhin examined a wide range of questions concerning the dialectic-materialistic interpretation of the methodology of physics. I. Ackchurin spoke of the fruitfulness of the widespread adoption of topological concepts and methods in modern physics. I. Frolov described the results of his researches into the correlation of organic determinism and teleology in biological knowledge. The Marxist concepts of types of social knowledge and integration of sciences were examined in detail in the reports of V. Kelle and E. Markarian. A. Starchenko in his paper outlined methods for a conceptual analysis of the notions "knowledge", "conviction" and "belief". V. Zinchenko described the results achieved in working out the methodological problems of the analysis of activity in Soviet psychology.

Of the other papers read at these sections the following attracted considerable attention: on the origin of the Universe (the prominent modern physicist J. Wheeler, USA); semantical analysis of genetic information (G. Stent, USA) and the axiomatising of biological theories (A. Lindenmayer, the Netherlands); logical and methodological analysis of action (R. Tuomela, Finland); research into the methodological foundations of the theories of culture (S. Nowak, Poland), logical analysis of language (J. Hintikka, Finland).

Special sectional symposiums were held at the Congress on the following questions: the status of learning theory (N. Mackintosh, Great Britain; P. Suppes, USA, and others); rationality in social sciences (J. Harsanji, USA; J. Watkins, Great Britain, and others); and the prospects for transformation grammar (J. Bresnan, USA; J.-R. Vergnaud, France, and others).

The history of logic, methodology and philosophy of science was discussed at the last, the twelfth section of the Congress. Here particular interest was attracted by the papers containing: an analysis of the sources of modern methodology (L. Laudan, USA); a description of the changing of the *a priori* concept (J. Mittelstrass, FRG); an attempt to interpret Galileo's understanding of the experiment (W. Shea, Canada). L. Markova's (USSR) detailed analysis of the difficulties involved in the historiography of science today, attracted the attention of many participants.

Definability and identifiability problems and the concept of matter and its development were discussed at the Congress's two intersectional symposiums. At the first of these, the papers of H. Simon (USA), V. Sadovsky and V. Smirnov (USSR), M. Przełęcki (Poland) and V. Rantala (Finland), focused on an analysis of the weaker kinds of definability and identifiability in comparison

with explicit definability, and also on the explication of the basic notions of definability theory. The materials of this symposium are without doubt of practical importance for the theory of systems, econometrics and some other disciplines.

At the second intersectional symposium E. McMullin (USA) expounded his understanding of matter and activity in Newton, and B. Kedrov formulated the basic principles of dialectic-materialistic interpretation of matter and examined the main stages in the development of this concept.

During the Congress the General Assembly of the Division of Logic, Methodology and Philosophy of Science met and elected new Council of the Division. P. Suppes (USA) was elected President of the Division and A. Markov (USSR) and R. Butts (Canada) — Vice-Presidents. The General Assembly proposed that the next, the Sixth International Congress of Logic, Methodology and Philosophy of Science be held in Uppsala, Sweden, in 1979.

When assessing the general scientific significance of the Fifth International Congress of Logic, Methodology and Philosophy of Science, it should be stressed that there is an ever increasing interest in the elaboration of a model theory, nonclassical logical systems, category theory, algorithmic logic, and logic and methodology of science change and growth. The Congress also showed that considerable progress has been made in recent years in research into the methodological problems of natural science and social disciplines. A noteworthy feature of the Congress was the large number of papers and reports given by scientists from the USSR and other socialist countries.

V. Sadovsky,
D. Sc. (Philos.)

THIRTEENTH PACIFIC SCIENCE CONGRESS

"Mankind's Future in the Pacific" was the theme of the congress which was held in Vancouver in August 1975.

The Congress, which was attended by more than 1,500 scientists from 48 countries, set up some 20 symposiums and science committees which discussed all aspects of research in the Pacific.

The Soviet delegation which presented 37 reports, participated in the work of most of the symposiums and committees. Papers on problems related to the humanities were read by four Soviet delegates — A. Kapitsa and Yu. Bromley, Corresponding Members of the USSR Academy of Sciences, Ya. Guzevaty, D. Sc. (Econ.) and K. Malakhovsky, D. Sc. (Hist.).

The symposium "Science and Social Science Policy: Resources and Strategies" heard 35 reports devoted to problems of regional and national policies in science and to individual regional and national science centres.

A. Kapitsa delivered a report entitled "A New Science Centre in the Soviet Far East". The audience was particularly impressed by the scope of research in the institutes of the Far Eastern Centre of the USSR Academy of Sciences, set up in 1970 in Vladivostok, where more than six thousand scientists and specialists are presently working and where high research efficiency is achieved by using the most sofisticated equipment.

Forty-four reports were submitted to the symposium "Pacific Populations and Their Implications for Scientific Research". Ya. Gusevaty in his report "On Interrelation of Population, Natural Resources and Environment in Social Development (with Special Reference to Experience in the USSR)" set forth the basic principles of the Marxist-Leninist theory of population, showed the scientific and practical untenability of the neo-Malthusian concepts and generalised the laws governing of population development and the experience of the rational exploitation of natural resources and protection of the environment in the Soviet Union. The reporter stressed that if the negative effects of the accelerated growth of the world population were to be averted it was imperative to solve as speedily as possible the crucial social and political problems of today and, first and foremost, to achieve general and complete disarmament and the channelling of military expenditures to peaceful aims.

Forty-three reports were filed with the science committee "Social Sciences and the Humanities". In his report "The Main Tendencies in the Cultural Development of the Indigenous Population of the Soviet Far East" Yu. Bromley showed the immense progress made in the years since the establishment of Soviet power by the national minorities in the eastern part of the USSR in their economic and cultural development.

K. Malakhovsky in his report "Problems of Strengthening Peace and Cooperation in Asia and the Pacific Basin" discussed the principles of peaceful coexistence of states with different social systems and the essence of the idea of collective security in Asia. The reporter noted that the Soviet Union which took the initiative in advancing this idea, proceeds from the vital interests of the Asian peoples themselves whose political, economic and cultural development depends on the establishment of a lasting and durable peace on the continent. Malakhovsky expressed the view that the principles that would govern a system of collective security in Asia could be equally applied in the conditions of the Pacific.

The Soviet delegation also presented a report "Soviet Studies of the Pacific in the Period Between the Twelfth and Thirteenth Congresses of the Pacific Science Association".

Besides reports, Yu. Bromley also read a series of lectures at the Department of Anthropology of the University of British Columbia on the subject "An Ethnographic Study of National Minorities in the Soviet Union", while K. Malakhovsky spoke at the University's Institute of Asian and Slavonic Studies on the subject "Soviet Oriental Studies: Current and New Lines of Research".

The Congress decided to hold the next, Fourteenth Pacific Congress in the Soviet Union, in Novosibirsk. Andrei Kapitsa, Chairman of the Presidium of the Far Eastern Science Centre of the USSR Academy of Sciences and Director of the Pacific Institute of Geography, was elected President of the Pacific Science Association.

K. Malakhovsky,
D. Sc. (Hist.)

TWELFTH INTERNATIONAL CONGRESS OF ONOMASTIC SCIENCES

The Twelfth International Congress of Onomastic Sciences whose general subject was "Names in Contact" was held in Bern in August 1975. It was attended by some 300 scientists from 33 countries. The following specialists read papers at the plenary meetings: P. Zinsli (Switzerland)—"Spuren sprachverschiedener Begegnung in den Ortsnamen der schweizerdeutschen Alpen" (Traces of Contacts with Different Languages in the Place-Names of the Swiss-German Alps Valleys); H. Guiter (France)—"Onomastique et contacts de langues: example des confins pyrénéo-méditerranéens" (Onomastic Sciences and Language Contacts; Examples from the Pyrenees and Mediterranean Area); E. Eichler (GDR)—"Sprachkontakte im Lichte der Onomastik (slawisch-deutscher Kontaktraum)" (Language Contacts in the Light of Onomastics [Slav-German Contacts]); and W. Nicolaisen (USA)—"Words as Names".

The main work of the Congress was conducted at six sections which discussed the following questions: language frontiers and multiple nomenclature; nomenclature and man (the sociological, psychological and philosophical aspects of nomenclature); onomastic sciences and linguistics (personal names in the linguistic system: synchronic references in the nomenclature, relations between the types of names); contacts with reference to the history of settlements, legal and socio-historical connections; cartography and onomastic sciences; literary name research.

Some 160 papers were read and discussed at the sections; of these about 100 dealt with place-names, and the rest with the anthroponym, the zoonym, the theonym, trade marks and general onomastic issues.

The material presented in the papers was to a considerable extent determined by the fact that the congress participants came from the GDR, Austria and part of Poland—zone of Slav-German contacts, from Rumania and Yugoslavia—zone of Slav-Romance contacts, from Switzerland, Belgium, the Netherlands and the FRG—German-Romance contacts, from Scandinavia—Finno-Germanic, and from Hungary—Slav-Germanic-Finno-Ugric contacts. Several of the reports were devoted to Albanian-Greek contacts, Slav-Greek, Thracian-Dacian and Romance-Arabic contacts. Papers of this type had been compiled mainly on place-name/toponymic material. They covered fairly considerable periods of history, gave much attention to the formation of toponymic loan translations, hybrid place-names and the multiple nomenclature of objects as a result of multilingual populations. A number of reports from the FRG were devoted to a critical analysis of historical sources.

There were only a few general theoretical papers. They dealt with such questions as the differentiation between proper names and common nouns, with interlingual homonyms on bilingual territories and with the functional place of proper names in a language and further theoretical onomastic issues in a region where there are language contacts.

Also examined were questions of naming and the name-giver, of names given and names abolished, of personal names and self-consciousness, of the attitude of children to the onomastic system and to certain names surrounding us, on the various aspects of fashions in names and to the changes which occur in the evaluation of names by members of certain sociums.

Just as at the previous 11th Congress which was held in Sofia in 1972 (cf. *Social Sciences*, No. 1, 1973) the question of the standardisation of geographical names was raised; some researchers were in favour of standardisation of spelling; others who consider that place-names are signs of individuality, proposed that maximum individuality of objects should be accepted as the basis of standardisation. A particular problem is presented by exonyms, the place-names of other countries used in the language of the given country in traditional forms, as for example, for Russian: Москва-Moskva-Moscow, Paris-Париж-Parizh; endonyms—place-names given by people speaking a certain language on a territory where another language dominates as well as names used in two different languages and names on historical maps. The reporters stated that standardisation was impeded by a number of local, national peculiarities.

The Soviet participants in the Congress read the following papers: N. Baskakov—"The Structure and Sense Models of Turkic Ethnonyms. The Problem of Language Contacts"; V. Belenkaya—"A Contrastive Study of the Toponymy of English-Speaking Countries"; G. Bondaruk—"Applied Onomastics (Based on Russian Place-Names)"; L. Guliyeva—"The Functioning of Place-Names in a Foreign Language Medium"; R. Dzharylgasinova—"The Evolution of the Anthroponymic Model of the Ancient Korean Rulers"; T. Pakhalina—"The Reconstruction of Ancient Macrotoponyms of the Pamirs"; and A. Superanskaya—"New Russian Names". The theses of papers by four other Soviet specialists were published in the Congress literature.

The final plenary meeting of the Congress adopted three appeals:

— to the governments of all countries with the request that in publishing materials intended for readers abroad a generally accepted system of transliteration should be used for those which use non-Latin alphabet;

— to all universities and academies to set up research centres for onomastic sciences;

— to the Greek Government with request that a series of maps or an atlas of Greece be published which would be suitable for onomastic research (there are no satisfactory maps of Greece at present).

The International Committee of Onomastic Sciences which met during the Congress, decided to hold the Thirteenth Congress in Krakow in 1978. M. Karaś (Poland) was confirmed as general secretary of the Committee. The general subject of the next congress will be "Proper Names—Common Nouns" (nomina propria—nomina appellativa)".

A. Superanskaya,
Cand. Sc. (Philol.)

CHRONICLE*

* *An international scientific symposium on "The Role of Scientists and Their Organisations in the Struggle for Disarmament"* was sponsored by the World Federation of Scientific Workers (WFSW) in June-August 1975 in Moscow. It was attended by more than 420 men of science from 62 countries and by representatives of 20 international organisations, including the United Nations and UNESCO. The opening speech was made by the WFSW Vice-President, Academician I. Artobolevsky (USSR). A message from CC CPSU General Secretary Leonid Brezhnev to the Symposium was read out by B. Ponomaryov, Alternate Member of the CC CPSU Political Bureau and CC CPSU Secretary. The introductory report was made by WFSW President E. Burhop (Great Britain), after which other speakers read papers on the topics of each of the five commissions formed by the Symposium. The topics of the commissions and the speakers were as follows: "The Social and Economic Aspects of Disarmament; the Economic Burden of the Arms Race and the Problems of Scientific Workers"—by Prof. G. Legay (France); "The Interdependence Between Détente and Disarmament; the Role of Organisations of Scientific Workers in Promoting Détente"—by Prof. H. Kröger (GDR); "The Problems of Ending the Arms Race and of Eliminating the Danger of a Nuclear War and the Scientists' Contribution to the Solution of These Problems"—by E. Primakov, Corresponding Member of the USSR Academy of Sciences; "The Banning of Chemical, Biological and Geophysical Weapons: the Scientists' Responsibilities"—by Th. Nemec (Stockholm International Peace Research Institute) and Academician E. Fyodorov (USSR); "The Specific Forms of Cooperation of Scientific Workers and Their Organisations with the Broad Movement for Peace and Disarmament"—by Dr. R. Prasad (India). The lively discussion that followed showed that the participants in the Symposium have come to a high degree of agreement in their positive assessment of détente. Many of the speakers emphasised that political détente should necessarily be supplemented by military détente, by new measures to curb the arms race. The final plenary meetings of the Symposium summed up the results of the commissions' work, and were addressed by Prof. E. Burhop, WFSW General Secretary, P. Biquard (France), and by Nobel Peace Prize winner Ph. Noel-Baker (Great Britain). The Symposium adopted an Appeal to the Scientists of the World.

* *An international conference on "The Principles of Peaceful Coexistence in the History of International Relations"* was conducted by the Institute of World History of the USSR Academy of Sciences jointly with a number of other academic institutes. It was attended by Soviet scholars as well as by scholars from Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Rumania, Great Britain, the Federal Republic of Germany, Finland, and France. The reports and speeches (28 persons took the floor) dealt with various aspects of the policy of peaceful coexistence in the period between the two world wars and in the postwar period. The Conference examined the following main issues: the history of the origin of peaceful coexistence and Lenin's role in creating its theoretical basis and in the practical realisation of its principles; the development of international relations in the 1920s-1930s; the continuity of Soviet foreign policy; the experience and lessons of the cooperation of the countries in the anti-Hitler coalition in the period of the Second World War; the changes in the development of international relations in the postwar period, in the late 1960s and in the 1970s; and the role of the Peace Programme adopted by the 24th Congress of the CPSU.

* *The all-Union scientific conference devoted to the 30th anniversary of the Soviet Union's victory in the war against militarist Japan* was attended by Soviet scholars, public figures and military leaders, and also by guests from Bulgaria, Czechoslovakia, the Democratic Republic of Vietnam, GDR, Hungary, Mongolia, Poland and Japan. The reports and speeches elucidated the role of the Soviet people and their Armed Forces in the rout of militarist Japan, the historical significance of the victory over Japanese militarism and the problems of postwar development in Asia, the role of the socialist community in establishing the principles of peace and international security in the Far East.

* *An all-Union scientific conference on "The Role of Women in the International Movement for Peace, Democracy and Social Progress"* was held on the occasion of the International Women's Year. It was attended by prominent scholars, the representatives of Soviet public organisations and of the international women's movement. A number of reports analysed in detail the experience gained in resolving the women's problem in the USSR and other socialist countries, and showed that socialism is the only social system to have brought women genuine emancipation, enabling them to take an active part in all spheres of political, economic and cultural life. A great deal of attention was paid to the status of women in present-day capitalist society and in the developing countries, to their important and ever growing role in the revolutionary and national liberation movement, in the anti-imperialist and anti-monopoly struggle.

* *An international symposium on "The Legislative Regulation of Women's Participation in Political, Economic and Social Life"* was organised by the Soviet section of the International Federation of Women Lawyers and by the Association of Soviet Lawyers. It was attended by representatives of 12 countries.

* *Bilateral meetings of Soviet lawyers and their colleagues from the USA and Italy* were held in the Institute of the State and Law, USSR Academy of Sciences. *The Soviet-American conference* was devoted to sea law and to the protection of the maritime environment. It considered, in particular, the rules of international law relating to navigation, fishing, maritime research and the sea bed, protection of the maritime environment from pollution and liability for causing damage to it, the biological foundations for the international legal aspects of the rational utilisation of the World Ocean's biological resources, and to peaceful means of settling international disputes concerning the sea.

* *The Soviet-Italian round-table sessions* discussed two basic questions: the legal problems of vertical and

* This review covers the events of June-August, 1975, in Moscow (unless stated otherwise).

horizontal integration in agriculture and those of the rational utilisation of agricultural lands.

* The Institute of Economics of the USSR Academy of Sciences and the Scientific Council on the Problem "The Economic Laws Governing the Development of Socialism and Its Growth into Communism" held *an all-Union scientific conference on "The Problem of Eliminating the Socio-Economic Distinctions Between Town and Country"*. It was attended by scholars from academic and specialised institutes, higher educational establishments, workers of Party and agricultural organisations, and by collective-farm chairmen. At the plenary meeting the opening address was delivered by the Director of the Institute of Economics, E. Kapustin. The main report, prepared by a group of scholars at the Institute, was read out by L. Nikiforov. Speeches were made on the general theoretical and the practical aspects of the Conference's topic. Then the participants in the Conference continued their work in four sections: "The Problems of Bringing Together the Two Forms of Socialist Ownership and Converting Agrarian Labour into a Variety of Industrial Labour"; "The Problems of Overcoming the Differences in the Living Standards, Conditions and the Way of Life of the Urban and the Rural Population"; "The Problems of Developing a National-Economic Agro-Industrial Complex, Inter-Branch Cooperation and Agro-Industrial Integration"; "The Role of New Forms of Settlement in Eliminating the Socio-Economic Differences Between Town and Country. The Problems of Migration of the Rural Population".

* *A symposium on "Problems of the Efficiency of Regional Economy"*, held in Ufa in the Bashkir Branch of the USSR Academy of Sciences, attracted more than 150 scholars and practical workers of planning bodies of the Union Republics and regions of the Soviet Union. The plenary meetings discussed the reports devoted to the effectiveness of development of the economic regions in the USSR, and to the methodological problems of regional economy under socialism. At their sittings the sections made a detailed examination of these issues: assessment of the efficiency and improvement of planning and management of the regional economy; the organisation of territorial-production complexes and the distribution of productive forces inside a region; the reproduction of labour power, the use of labour resources and living standards in a regional context; the regional economic problems of improving the utilisation of natural resources and the environmental protection.

* Scientists from more than 30 countries took part in the work of the *Third World Congress of the Econometric Society* held in Toronto (Canada). The Congress was attended by delegations from the socialist countries: the GDR, Hungary, Poland, Rumania and the Soviet Union. The work of the Congress which heard 600 reports was conducted in the following five sections: statistical methods in econometrics; allocation and equilibrium; microeconomic models; macroeconomics; miscellaneous. A special plenary meeting was devoted to the reports by Soviet scientists: Academician L. Kantorovich — "Models of Growth of a Guided Economy with Due Account of Technological Progress"; Prof. K. Bagrinovsky — "Problem-Complex in Optimal Planning"; and S. Aivazian — "Probabilistic-Statistical

Modelling of the Distributary Relations in Society".

* Some 800 scientists from more than 30 countries took part in the *Eighth International Congress of Phonetic Sciences* held in Leeds (Great Britain). Such well-known phoneticians as G. Fant (Sweden), E. Fischer-Jørgensen (Denmark), D. Fry (Great Britain), B. Lindblom (Sweden), A. Martinet (France), M. Romportl (Czechoslovakia), K. Stevens (USA) and others read papers and spoke in the discussions. Soviet phonetics was represented by a considerable number of theses for reports on all the main trends in speech acoustics research, the physiology and pathology of speech, phonology, intonations and suprasegmental signs of speech. Seven Soviet participants read the following papers: A. Antipova — "Units of Rhythm in English Prose and Verse"; L. Zlatoustova — "Acoustic Characteristics of the Poetical Text"; V. Kasevich — "On a Phonological Theory for Monosyllabic Languages"; A. Steponavichius — "On Types of Sound Change"; I. Torsuyeva — "The Linguistic Bases of Intonation Analysis"; G. Shabadash — "International Means of Expressing Emotions of Disapproval ('Reproach-Reprimand') in English", and I. Zhgenti — "The System of Vowel and 'Semi-Vowel' Phonemes in Modern French". The next Ninth Congress will be held in 1979 in Copenhagen.

* At the *Fifth Congress of the International Society of the Germanic Languages and Literatures* held in Cambridge (Great Britain) and which attracted some 400 participants from 35 countries, about 180 reports were given on the state of research over the past few years on questions in which the Society is interested. Members of the Soviet delegation read the following papers: V. Yartseva, Corresponding Member of the USSR Academy of Sciences — "The State and Development of General Linguistics and Germanic Studies in the USSR"; A. Ufimtseva, D. Sc. (Philos.) — "The State and Elaboration of Semasiology and Lexicology in the USSR"; and S. Mironov — "The Social, Functional and Stylistic Differentiation of the Language of the Netherlands in the 17th Century".

* *A conference on Meroitic Studies* was held in Leningrad and attended by researchers of the Institutes of Oriental Studies, Ethnography, and Sociology of the USSR Academy of Sciences, of the State Hermitage, and by professors and teachers of the Moscow and Leningrad universities. The Conference heard and discussed reports on the problems of source studies, ethnography, linguistics, cults, of Cush and the surrounding world. Great interest was aroused by these reports: "The *Ethiopica* of Heliodor as a Source of the History of Meroë", "The 'Group-C' Problem in the History of the Culture of Ancient Sudan", "The Deciphering of West Lybian Inscriptions", "The Present State of Study of Meroitic Inscriptions", "Arensnouphis and His Cult in Cush", and "The Principles of Succession to the Throne in Kataban".

* *An international symposium on "The Problems of Soviet Literature's Ties with Other National Literatures of the World"* was held in Sofia. It was attended by 250 scholars and specialists from 17 countries of Europe, Asia and America, including the Soviet Union.

* *A scientific-methodical conference on "The Language of Scientific*

Literature (Linguistic Problems and Teaching Methods)" was held by the Foreign Languages Department of the Institute of Linguistics of the USSR Academy of Sciences. The participants in the Conference — the researchers and teachers of the Foreign Languages Departments of the USSR Academy of Sciences and the Academies of Sciences of the Union Republics — heard and discussed at the plenary meetings, reports on the problems encountered in studying the style of the language of science, in teaching research workers to read scientific literature in foreign languages, and in giving them instruction in oral speech in a foreign language. The issues connected with these problems, with reference to specific languages, were examined at the meetings of the English-, French-, German- and Russian-language sections.

BOOK REVIEWS

БРЕЖНЕВ Л.И. *Об основных вопросах экономической политики КПСС на современном этапе.* Речи и доклады. В 2-х томах. М., Политиздат, 1975, т.1, 448 стр; т.2, 479 стр.

BREZHNEV L.I., *On the Main Questions of the CPSU's Economic Policy at the Present Stage.* Speeches and reports in two volumes, Moscow, Politizdat Publishers, 1975, Vol. 1, 448 pp; Vol. 2, 479 pp.

For the Communist Party and the Soviet state, Lenin emphasised, economics is the main policy, upon the success of which to a decisive degree depends the advance towards communism and the consolidation of the international positions of the USSR. Economic questions are in the forefront of the Party's theoretical and practical activities, are in the centre of attention of Party congresses, plenary meetings of the Central Committee of the CPSU and of the Politburo of the Central Committee.

Substantiation and elaboration of the Party's economic policy, the ways for its implementation and generalisation of the experience accumulated in guiding the building of the material and technical basis of communism — such is the main content of the two-volume collection of speeches and reports *On the Main Questions of the CPSU's Economic Policy at the Present Stage* by L.I.Brezhnev, General Secretary of the CC CPSU. The volumes include, in full or in parts, already known speeches and reports made in the period between 1964 and 1975. Published for the first time in this edition are Brezhnev's speeches at Central Committee plenary meetings which discussed the drafts of annual economic development plans and the state budget. The collected materials give a comprehensive picture of the purposeful and fruitful activity of the Party's Central Committee and of the Soviet Government in managing the national economy, in strengthening the economic power and defensive might of the country and in guiding communist construction.

The two-volume edition convincingly shows the Communist Party's scientific approach to the elaboration of revolutionary theory and practice in conformity with the tasks and conditions of the times and Brezhnev's signal contribution to the col-

lective elaboration of the basic guidelines of Soviet society's further socio-economic advance.

The materials under review have enriched the Marxist-Leninist teaching with a profound characterisation of developed socialism; they show its role and place in the building of a communist society.

The fundamental propositions enunciated in the collection, which are tied up with concrete economic and political tasks, lend it exceptional significance both as a sum total of the creative development of Marxist-Leninist thought and as a document containing the CPSU's instructions on issues concerning the country's socio-economic progress at the present stage and in the foreseeable future.

For developed socialist society with its immense economic power based on a diversified industry and large-scale collective farming the full utilisation of the advantages of the planned system of economy, of all the internal possibilities it possesses for expanding production is of particular importance. This has given rise to the need to improve the standard of all economic activity aimed at raising the efficiency of the economy and turning it into a still better working, well-adjusted mechanism.

The materials show how the CPSU, on the basis of a scientific scrutiny of the essence of social processes, defines the goals towards the achievement of which the Soviet economy must be oriented, discloses the sources of growth and resources which must be mobilised if social production is to expand at a still more rapid rate, charts the path along which to perfect the management mechanism designed to ensure further improvement in the level of planned economic guidance.

The course towards substantially raising the people's standard of living is the core of the Party's socio-economic programme for the further development of Soviet society. This course determines the general perspective for it proceeds from the supreme aim of social production under socialism. Concern for the individual, for steadily raising the living standards of the Soviet people, is the recurring theme of all Brezhnev's speeches and reports. They thoroughly substantiate the measures taken by the CPSU to steadily raise the real incomes of the population, to expand the production of consumer goods, to improve the health services, develop public education and the service industries. Special attention is paid to improving housing conditions in pursuance of fulfilment of the historic task advanced by the Land of Soviets, that of providing every family with a modern, comfortable flat.

The major social measures aimed at advancing the welfare and cultural standards of Soviet people rest on most effective use of the productive forces of Soviet society. The main feature of the present stage of development, we read in the collection, is that along with quantitative factors of economic growth increasing emphasis is being put on qualitative factors.

Raising the productivity of labour presupposes equipping all branches of the economy with the latest machinery and technology. The CPSU considers scientific and technical progress as the pivot of its entire economic policy. It must, Brezhnev underscores, reach into all spheres of production, encompass bold scientific discoveries and endless improvements in technology, new machinery and instruments — in a word, everything that protects and facilitates the labour of man, makes it more productive and interesting.

The materials give a comprehensive picture of the CPSU's extensive activities aimed at promoting the organic fusion of the achievements of the scientific and technological revolution with the advantages of the socialist economic system. Scientific and technical progress is the main lever for building the material and technical basis of communism, is one of the main spheres of the competition between socialism and capitalism in the international arena.

The course towards raising the effectiveness of industrial production implies improving whole complexes of interconnected industries whose development follows a definite programme, and the intergrated development of the country's economic regions. The development and strengthening of the fuel and power base, the establishment of new industrial centres in the country's Eastern regions, the priority development, for instance, of such modern industries as electronics and instrument-making — all these are links in the chain of the further development and advance of Soviet industry.

The Communist Party and the Soviet Government have always made it their concern to ensure the sound development of agricultural production. The decisions of the March (1965) and subsequent plenary meetings of the CC CPSU and of the 23rd and 24th Congresses of the Party map out a comprehensive economically substantiated agricultural development programme. The fundamental questions of the Party's agrarian policy at the present stage of development of the USSR are formulated in Brezhnev's speeches and reports: creation of economic conditions stimulating the growth of agricultural production, including a new system of procurements, sharp increase in investments, implementation of a long-term comprehensive programme of mechanisation and chemicalisation of agriculture and land improvement, the development of agricultural sciences, improvement of the forms of organisation and management. On the initiative of the CPSU an extensive programme has been drawn up for the further cultivation of the non-black soil area of the RSFSR.

The volumes under review also give a comprehensive picture of the enormous work carried out by the CPSU in resolving such key questions of economic policy as improvement of economic planning, and of the entire economic mechanism.

The speeches and reports bring out the importance of evolving scientific methods of planning and modernising them, of more thoroughly substantiating the scientific and technical validity of plans — both current and long-term — and of decisions taken at all levels of economic guidance.

The collection spells out the CPSU measures to further improve the system of economic management — restoration and wide introduction of the sectoral principle of management, raising the level of centralised planning guidance while simultaneously expanding the operative independence of the self-supporting units, creation of all-Union and Republican industrial and production associations (combines). The speeches and reports formulate the new, heightened demands expected of Party guidance of the

economy, show the increased role of Party organisations in mobilising the masses to carry out the economic plans successfully.

Profoundly analysing the Party's activity in guiding the economy and noting its successes Brezhnev at the same time pinpoints the problems still awaiting their solution, centers the attention of Communists and of all working people of the USSR on the importance of accomplishing the tasks facing the country, of overcoming existing difficulties and of making the fullest use of reserves. Strong criticism is levelled at such negative features as bureaucracy, parochialism and the narrow departmental outlook.

The speeches and reports are imbued with a deep faith in the inexhaustible creative forces and energy of the Soviet people — the workers, peasants and intellectuals of the multinational Soviet Union. The experience of the innovators of production, of foremost work collectives, regions, areas and republics, are broadly generalised. We see how communist construction gives birth to real heroes of labour. Their inquisitive mind, experience and knowledge, their creative approach and initiative act as a powerful accelerator of the country's progress. This is most vividly demonstrated by the country-wide scope of socialist emulation, by the movement for a communist attitude to labour.

The collection convincingly shows the leading role of the working class which represents the main political force and decisive factor in the development of Soviet society. Under the leadership of the Communist Party and in alliance with the peasantry and the intelligentsia the Soviet working class has proved its ability to govern the state. Today the Soviet worker, the Soviet collective farmer or the Soviet intellectual is a person who does not simply show a conscientious attitude to his work, but who lives the interests of his enterprise, district, region, republic, the entire country.

Brezhnev's collected speeches and reports reflect the Party's comprehensive approach to the tasks of the country's development and their fulfilment, the organic connection between the solution of economic problems and of socio-political and cultural problems. The author examines in detail the problem of elimination of the distinctions between manual and mental labour, between town and country, and between classes, the processes shaping the social homogeneity of Soviet society; substantiates and formulates the Party's course towards further improvement of socialist democracy, growth of the creative activity and initiative of the masses, still greater diversity of the forms of participation by the working people in the management of public affairs.

The materials in the two volumes are graphic confirmation of the organic unity of theory and practice, characteristic of the CPSU's activities, of its scientific and creative approach to the solution of difficult socio-economic problems. They show the growing role of the Party in communist construction, in the elaboration and implementation of an economic policy corresponding to the stage of developed socialism.

The entire experience of socialist management of recent years convincingly demonstrates that the CPSU's economic policy correctly reflects the objective requirements of Soviet society's development towards communism, shows the right

way to solving new, bigger and more difficult tasks. In accordance with the instructions of the 24th Congress, the Party has prepared the new, Tenth Five-Year Plan which is closely tied up with the general long-term economic development plan for 1976-1990 and which will become a component part of this plan.

The collection gives a penetrating analysis of the prospects of the further development of the world socialist system and of the multilateral cooperation of the fraternal countries on the basis of socialist economic integration. Businesslike cooperation with capitalist countries on the principles of peaceful coexistence is examined from Marxist-Leninist positions.

The Soviet Union stands for the continuous development of technico-scientific and cultural international cooperation on the basis of complete equality and mutual advantage, which rules out discrimination and interference in the internal affairs of other countries. The materials under review contain an analysis of the positive changes achieved in the course of the positive development of the Soviet Union's relations with the USA, France, FRG, Italy, and many other capitalist countries.

The Soviet Union and other socialist countries, we read in the collection, are the natural allies of the developing countries which are waging a struggle to solidify their political and economic independence. True to their internationalist duty the CPSU and the Soviet people have rendered and are continuing to render allround assistance to the peoples of the developing countries in their struggle against the aggressive intrigues of imperialism and the attempts to impose on them new forms of colonial dependence.

Much attention in the speeches and reports by L.I.Brezhnev is devoted to the prospects of the world socialist system, to a definition of the general laws of its development. A number of countries of the socialist community have now entered the phase in their history which their Communist parties define as the building of mature, or developed, socialism. At this stage major and very complex tasks face them: how best to combine the advantages of the socialist system with the latest scientific and technical achievements; how to ensure on this basis a high efficiency and balanced development of the entire economy and a substantial improvement in the people's well-being; in what forms to extend the work of educating people in the spirit of communist consciousness; along what lines to further creatively develop socialist democracy; how to raise the cooperation of the fraternal states to a new level.

The living example of the socialist countries, their achievements in economic, scientific and cultural development, in raising the living standards of the people, and in educating the new man convince millions of people all over the world of the correctness of the road of human progress indicated by Marxism-Leninism and which Communists are fighting for.

True to the behests of the great Lenin the CPSU and the Soviet people are devoting their efforts to building a communist society, to the struggle for the freedom and national independence of peoples, and for democracy, social progress, and world peace.

ТРАПЕЗНИКОВ С. П. *Ленинизм и аграрно-крестьянский вопрос*, в двух томах. 2-е доп. изд. М., изд-во «Мысль», 1974. т. 1, 567 стр; т. 2, 645 стр.

TRAPEZNIKOV S. P., *Leninism and the Agrarian-Peasant Question*, in two volumes, second enlarged edition, Moscow, Mysl Publishers, 1974, Vol. 1, 567 pp.; Vol. 2, 645 pp.

The first volume, *Lenin's Agrarian Programmes in the Three Russian Revolutions*, gives a socio-economic characteristic of Russia's peasantry before the revolution, analyses the agrarian programmes of the political parties of that time, and throws light on the Leninist stage in the theory of the agrarian-peasant question, the elaboration of the agrarian programme of the Russian Social-Democratic Labour Party (RSDLP) as applied to the bourgeois-democratic and the socialist revolution, and the agrarian policy of the Communist Party at the first stage of the transitional period from capitalism to socialism.

The second volume, *The Historical Experience of the CPSU in the Realisation of Lenin's Cooperative Plan* shows how this plan constituted the scientific basis for the reorganisation of agriculture, the process of the revolutionary break up of the old type of economy in agriculture and the creation of the new, collective-farm type of economy, and the change in the consciousness and mode of life of the rural working masses. The author deals at length with the development of the collective-farm system in the USSR after the victory of socialism. He proves convincingly that during the Great Patriotic War the collective-farm system fully demonstrated its strength and viability, and stood the test of time. The volume contains an analysis of the postwar development and the new vistas of socialist agriculture. The concluding chapters are devoted to the further development of the Party's Leninist agrarian policy in the decisions of the March 1965 and subsequent plenary meetings of the CC CPSU, and to the successful implementation of these decisions.

The agrarian-peasant question is one of the key issues in the theory and practice of Leninism. In his analysis of the historical solution of this problem in the USSR, the author has succeeded in showing the correlation of its general and specific aspects. His conclusions and generalisation therefore acquire an international significance.

Agrarian relations have deep roots in the history of mankind. The age-long peasant issue can be finally settled only in conditions of the socialist social system. Neither in alliance with the class of slaves, in combat with the ruling class of feudal lords, nor under the aegis of the bourgeoisie was the peasantry fated to achieve radical changes in agrarian relations or win a just solution of the land question. Success comes to it only in conditions of the proletarian liberation movement, in joint struggle with the proletariat and under its guidance. The agrarian question, on the other hand, has an important bearing on the struggle of the proletariat, for it is a question of the proletariat's chief ally.

The founders of scientific communism therefore attached great importance to linking the proletarian revolution with the peasant war. They proved that the unification of the toiling peasantry under the leadership of the proletariat during the liberation movement was dictated by

the vital interests of the two classes and the interests of socialism. While creatively developing Marxism and the theory of the socialist revolution, Lenin paid paramount attention to the question of the peasantry as the proletariat's ally in the revolution. He worked out a harmonious theory of the agrarian question. Lenin's concern with this issue becomes particularly understandable if we recall that his theory of the socialist revolution was to be applied in practice primarily in Russia, largely a peasant country. The author writes in this connection: "Looking back from the summit of our epoch, at the road we have traversed, we can say that the correct and truly scientific solution of the agrarian problem in Russia was provided by Marxist thought, at the head of which stood Lenin, great theoretician and revolutionary. His theoretical legacy, embodied in the living revolutionary practice of the masses, remains a most valuable programme of action today, too. The vital force of the Marxist-Leninist theory lies in the fact that it has provided the scientific basis for the radical reorganisation of agriculture and for winning the peasant masses over to socialism."

The author focuses attention on the generalisation of the world's first experiment in the socialist reorganisation of agrarian relations and their development in conditions of socialism, the experiment that turned petty peasant owners into working people of the socialist countryside.

In his analysis of Lenin's agrarian programmes in the three Russian revolutions, the author notes: "Having linked the agrarian problem with the class and political struggle of the proletariat, Lenin indicated how to unite the revolutionary-democratic movement of the peasantry with the socialist movement of the working class." This was accomplished on the basis of the proletariat's hegemony first in the democratic and then in the socialist revolution. Leninism smashed the anti-Marxist "theories" of foreign and Russian opportunists who were trying to substantiate the alleged antagonism between the proletariat and the peasantry.

The proletariat's attitude towards the peasantry and its various groups was not, of course, invariable. During the bourgeois-democratic revolution, the proletariat allied with the whole of the peasantry, but in the socialist revolution only with the proletarian and semi-proletarian strata in the countryside. This Leninist precept underlay the Bolshevik Party's strategy concerning the agrarian question during the three revolutions. Adherence to this strategy became one of the most decisive factors of the bourgeois-democratic and socialist revolutions in Russia and the development of the former into the latter.

The book contains a profound analysis of the Leninist agrarian programme and its implementation during the October Revolution, the progress of the socialist revolution in the countryside, the birth of the new, socialist forms of the economy and other key problems. The author distinguishes three propositions that were of fundamental importance for the solution of the agrarian problem — immediate confiscation of the big landed estates and the nationalisation of all the land; organisation of the rural proletariat into an independent class force; and theoretical substantiation of the need for creating two types of rural economy — state farms (state enterprises) and collective farms, uniting small and middle peasant producers. The consistent introduction of these programme propositions marked the

beginning of a new era in the history and life of the peasantry.

In his analysis of the contradictions that arose in the economy of the Soviet state during the initial stages of its history, the author notes that the birth of the collective-farm system was the result of the objective necessity, not in simply a large-scale economy but in an economy based on socialist principles.

The monograph rightly notes that before the October Revolution, political economy and history dealt in detail with the question of how petty commodity production was engendering capitalism, but it was only the experience of socialist construction, generalised by the science of Marxism-Leninism, that provided the scientific basis for determining the laws governing the evolution from petty commodity production to socialism. This scientific discovery is of tremendous international significance since the peasantry still constitutes the bulk of the world population. Of course, the development of socialist relations in the countryside follows a different pattern in different countries, it has its own specific features, but in all of them we see the same objective laws in operation. The author discloses these objective laws, and shows the basic difference between the evolution of the peasantry under the bourgeoisie and in conditions of the socialist ownership of the means of production.

Socialist cooperation of the peasant economy has its own and inherent regularities rooted in the leading role of the public ownership of the means of production. In his scientific analysis of the process of the development and triumph of the collective-farm system in the USSR, the author characterises the dialectics of this process and the contradictions that arise and are eliminated in the course of this process. The breakdown of capitalist production relations was accompanied by an acute class struggle and the remoulding of the consciousness of the peasantry. S. Trapeznikov deals at length with the various stages in the formation of socialist production relations in the countryside, and the victory of these relations, as well as with the new contradictions arising from the need to affirm socialist labour discipline. In his assessment of the objective laws governing the advancement of the collective-farm system, the author underlines the outstanding role of the CPSU in the formation and consolidation of socialist production relations in the Soviet countryside.

Shortcomings and distortions in the Party's agrarian policy were of course, unavoidable in such a new and major undertaking. The author shows how the CPSU overcame these shortcomings and ensured the consolidation and steep upsurge of agriculture. More important, he shows the continuity of the Party's agrarian policy based on the creative development of the Marxist-Leninist theory.

The author resolutely rebuffs the various bourgeois and revisionist falsifications of the policy of the CPSU. He also disproves in well-reasoned arguments the assessments of collectivisation by pseudo-theoreticians who asserted that the Party's class policy during that period was incorrect.

One of the chief tasks of socialist and communist construction is the steady development of agriculture. Reviewing the prospects of the economic growth of the USSR, the author draws attention to the fact that the further swing of the productive forces in agriculture will make it possible to accomplish two basic and

interrelated tasks: to build up an abundance of high-quality food products and of industrial raw materials, and to effect the gradual introduction of communist relations in the countryside.

The agrarian policy, evolved by the Communist Party in recent years, covers both the productive forces and production relations in the countryside. It is profoundly scientific in character and it serves as the guideline of activity for millions of Soviet people. The present agrarian policy of the CPSU is a component of its general strategy aimed at the creation of the material and technical basis of communist society in the USSR, the formation of communist social relations, and the harmonious development of the new man. In the past decade this policy has brought about a turning point in agricultural production — greater yields and harvests of grain, sugar beet, cotton and other crops, and also higher productivity of cattle-breeding.

The results achieved confirm the correctness of the Party's agrarian policy, expressing the fundamental interests of socialist society at the present stage. S. Trapeznikov points out that the better utilisation of the advantages of the socialist system of management and the elimination of subjectivism and voluntarism in economic management put into action formerly latent reserves of agricultural production and of the national economy as a whole. The Party's present course in the countryside rests on the basic propositions of Lenin's agrarian theory, particularly, on Lenin's ideas of the consistent intensification of agricultural production, on stimulating in every possible way the economic interest of the collective in the result of their labour, on giving material and moral incentives, and on greater responsibility for the results of production.

After examining some of the questions related to the organisation of modern agricultural production, particularly, public land tenure and higher efficiency of crop-growing and cattle-breeding on the new material and technical basis, S. Trapeznikov highlights its characteristic features — accelerated scientific and technological progress in crop-growing and cattle-breeding which makes for the industrialisation of all branches of agriculture, and particularly of cattle-breeding.

Modern production sets rapidly rising demands not only on machines and technology, but also and primarily on the workers, on those who create these machines and control this technology. Efficient work is impossible without specialised knowledge, a high degree of professional training and general culture. All this depends to a considerable extent on the standard of living, and on how fully the material and spiritual requirements of Soviet people can be satisfied. Therefore, as the author shows convincingly, the Party's agrarian policy is not restricted to production issues in agriculture; it also embraces the social processes that are taking place in socialist society.

That is precisely why one of the most important propositions of Lenin's agrarian theory reflected in the Party's present agrarian policy is directed towards consolidating the close alliance and friendship between the working class and the peasantry, towards promoting closer links between town and countryside, and creating an integral and monotype system of economy, incorporating industry and agriculture on a single and planned socialist

basis. This difficult and complex task has been successfully accomplished in the USSR. The Party pursues a course towards the all-round intensification of agriculture, improvement of its material and technical basis, towards achieving greater yields per hectare and higher productivity of cattle and poultry-breeding. The reconstruction of agriculture on a modern industrial basis is a most important aspect of the Party's agrarian policy at the present stage.

The author gives a picture of the results of the Party's present agrarian policy, and notes that the main result, and one of prime importance, is the consolidation of the material and technical basis of all branches of the national economy and the steady growth of the material and technical potential. For example, the volume of capital investments in agriculture was nearly doubled from 48,600 million rubles in 1961-1965 to 82,200 million rubles in 1966-1970; during three years (1971-1973) of the Ninth Five-Year Plan, nearly 72,000 million rubles were allocated for the needs of agriculture.

The second result, just as important, is the higher returns from the massive material investments in agriculture. In 1961-1965 the state was purchasing an average of 51.6 million tons of grain annually; in 1966-1970 the figure went up to 66 million tons; during the bumper-harvest year of 1973, when the country produced the record-high harvest of 222.5 million tons of grain, the state purchased more than 90 million tons.

The third important result is the considerable improvement in the living standards of the collective-farm peasantry. This, naturally, wholly depends on the development of the productive forces and production relations in the countryside. The distinctions in the socio-economic, cultural and living standards between town and countryside are being eradicated at an active pace. In this connection, the author notes the importance of such major measures as the introduction of guaranteed pay and old-age pensions on collective farms.

The monograph pays particular attention to the new processes typical of Soviet agriculture today. These include the improvement of management and the application of new forms of the concentration of agriculture that ensure further advance on the basis of specialised inter-farm and agro-industrial cooperation. New types of enterprises are appearing in the countryside: agro-industrial complexes, cattle- and poultry-breeding industrial-agrarian complexes, and state-collective farm or collective-state farm associations. The transition to large-scale specialised production in agriculture based on industrial methods and the broad application of scientific and engineering achievements is of great importance.

The monograph discloses the international significance of the Leninist cooperative plan and the results of the socialist transformation of agriculture in the USSR. To the Soviet Union fell the high mission of becoming the world's first country with a large-scale socialist agriculture. The historical experience accumulated by the CPSU in the course of the socialist reorganisation of agriculture is a major contribution to the theory and practice of scientific communism. The author writes in this connection:

"The triumph of the collective-farm system in the USSR is brilliant verification in practice of the Marxist-Leninist teaching that the socialist reorganisation of agriculture is the inevitable economic requirement of the development of society's productive forces and its production relations. Proof of this is the fact that the peasantry in many socialist countries have firmly taken the road of socialist transformations. Their experience provides splendid examples of a creative approach to the solution of this difficult and complex problem of society's progress".

The abundant factual material, conclusions and generalisations contained in S. Trapeznikov's book convincingly testify to the vital force of the Marxist-Leninist theory that furnished the scientific foundation for the socialist reorganisation of agriculture and for drawing the peasant masses into the building of socialism. The author writes that the wise Leninist policy of the CPSU and its untiring organisational work made it possible to give full scope to the mighty talent and creative forces of the people — the producers of the material wealth of society and the real creators of communism.

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АФАНАСЬЕВ В. Г. *Социальная информация и управление обществом.* М., Политиздат, 1975, 408 стр.

AFANASYEV V. G., *Social Information and the Administration of Society,* Moscow, Politizdat Publishers, 1975. 408 pp.

As the title suggests, the book discusses an element of information that is one of the most important for the individual and for society, and one that does not easily lend itself to investigation.

The various aspects of social information in socialist society are examined as elements of the theory and practice of administration of this society.

The role of information is particularly apparent in decision-making and in the realisation of decisions. A decision is a cluster of information which is socially collected, analysed and processed by the subject of administration. It is a synthesis of information on the present with information on the future, expressed in the form of a programme of activities and its aims. The nature of these aims is determined by the type of society; decision-making under socialism is a process that is oriented, first and foremost, towards the individual, towards uplifting the material and cultural level of the working people and developing socialist relations.

Guided by the principles of Marxist-Leninist methodology, Afanasyev formulates the general requirements to social information, which, if satisfied, enable it to serve as an effective instrument of administration. These requirements include: a class and party approach to its analysis and assessment; that the information be complex, optimal, complete, accurate, reliable and

objective; timely, concise and logical; economical, useful and fresh.

The class and party approach to socio-political information is viewed by bourgeois theorists as a rejection of its objective and scientific character. In reality the objectivity of information depends on which particular class shapes and uses it. "We Marxists," wrote Lenin, "must exert every effort to make a thoroughgoing study of the facts underlying our policy." (V. I. Lenin, *Collected Works*, Moscow, Vol. 25, p. 275.)

At present, notes the author, the application of the social sciences as sources of information for resolving practical administrative tasks in various spheres of social life is acquiring increasing practical importance. In the conditions of developed socialism these tasks are becoming increasingly complicated. Their solution requires a system approach as also does, essential for this, social information, its processing and utilisation. This presupposes not only the development of general ideas and concepts reflecting the basic tendencies in society's progress, but also an analysis of the varied empirical manifestations of these tendencies and extensive work in translating general concepts into the language of concrete facts. A bigger role is played by such spheres of knowledge as concrete sociological investigations and statistics.

A big role in the USSR is also played by such a source of information as the analysis of various documents, including letters of working people to the Party, Soviet and economic organisations, to the newspapers and magazines and to the radio and TV stations. Basing himself on concrete data, the author shows that a systematic study of these letters makes it possible to discover certain societal tendencies and the common nature of many individual phenomena. The importance of diverse forms of direct communication between executives and subordinates, and with the broad mass of working people is also growing.

Of considerable interest is the author's elaboration of the theoretical problems of social information systems. He explores the essence and elements of information systems, the aims and tasks they pursue, the subject and means of information work and the effectiveness of these systems. He shows conclusively that only socialism possesses the possibilities for creating a single national information system.

The author draws the conclusion that the automation of individual aspects of administration can in no way replace it as the creative work of an entire system of agencies and organisations performed with the active participation of millions of Soviet working people under the leadership of the Communist Party. Man has always been and will ever remain the principal link in any information system, the automated systems included, its architect and user—this idea runs through the entire work.

N. Lapin,
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Проблемы воспроизводства в странах СЭВ. М., Изд-во «Экономика», 1974, 248 стр.

The Problems of Reproduction in the CMEA Countries, Moscow, Ekonomika Publishers, 1974, 248 pp.

The main trend in the economic cooperation of the member countries of the Council for Mutual Economic Assistance at the present stage is the realisation of socialist economic integration. An ever closer relationship is being forged between the processes of reproduction within the framework of the CMEA countries' national economies, and this helps make the economy more efficient in each country. An analysis of the general natural features of socialist reproduction based on the materials of different countries and the revelation of the specific features of their economic development serves as an important condition for the correct solution of the issues of socialist economic integration, of consonant coordination of the general and national interests in the process of the CMEA countries' economic cooperation. The work under review, a joint work by authors from the Institute of the Economy of the World Socialist System of the USSR Academy of Sciences (ed. K. Mikulsky) is devoted to a comparative analysis of this type.

The book deals with the main factors contributing to the economic growth, the general and the particular, the natural and the accidental in the economic development of the CMEA countries, and the most pressing questions with regard to the improvement of socialist reproduction.

In the introductory chapter analysing the present-day tendencies in reproduction in the CMEA countries it is justly stressed that it is a question of the coming into being and development of a new type of reproduction typical of a developed socialist economy. Here the role of the scientific and technological revolution and the process of combining its achievements with the advantages of the socialist economic system are revealed. Of great scientific interest is the treatment of another problem solved by these countries, which is formulated in the book as the organic combination "of the technical and economic opportunities offered by the economic integration processes with the social advantages of international economic relations of a socialist type".

The authors have managed to combine the elucidation of a number of problems relating to reproduction with an analysis of management and show both what has been achieved in this field and also the large reserves which still have to be brought into operation. The authors' attempt to avoid a limited approach to the work on improving methods of socialist management and to some organisational and technical problems, deserves support. They stress that this is above all a social task which consists in making skilful and complete use of the social advantages of the socialist mode of production and in the utmost development of the social and production activity of the workers.

A large part of the monograph is devoted to the characteristic features of the quantitative and qualitative factors of the economic growth in the countries in question—labour resources, capital investments and production funds, labour productivity, stocks and capital consumption in production.

In the book considerable space is given to the role of external factors in the process of expanded socialist production and of the cooperation of the socialist countries' national economies. Here external economic activity appears, on the one hand, as a specific sphere of economic management whose results are expressed in a country's extra net income and, on the other hand, as a form of expanding the sphere of operation of all the branches of the economy; this, on the basis of cooperation, makes it easier to obtain technical equipment and to gain access to the limited supply of raw materials and facilitates increased specialisation in production. In this work special emphasis is laid on the second side of the role of the external factor. At the same time the complex approach peculiar to the external economic ties of the socialist countries is stressed. Combining their efforts to solve the cardinal problems pertaining to the national economy, close cooperation in planning, scientific research, production and sales of output allows these countries to extend the coordination of the national production processes and to guarantee the highly efficient functioning of the national economy in each country.

In the book attention is focused on the main method of implementing the system of mutual economic ties — on the joint planning activities and above all on coordination of national economic development plans.

From the point of view of the scope of engagement of the able-bodied population in various kinds of socially useful activity, the CMEA countries have attained full employment and thus solved an important social problem. Today, a more efficient use of labour resources is of paramount importance. It is just in the way in which the manpower is used that the ability of socialism to combine the achievements of the scientific and technological revolution with the allround development of man's creative abilities, is most clearly manifest. It is only natural that the authors should give much thought to a new factor in making more efficient the use of manpower — the development of cooperation between the CMEA countries in this field. Socialist economic integration stipulates the development of principally new forms of joint use of manpower, which cannot be realised under capitalism.

In the work under review much attention is devoted to an analysis of the productivity of labour factor. It is justly noted that raising the productivity of labour does not necessarily entail a slowing down of its growth. With their growing economic potential the CMEA countries have at their disposal fresh and greater opportunities to raise it even further. This is a result both of the accelerated scientific and technological progress and of those reserves which can be assimilated by improving the methods of socialist economic management. The course towards the intensification and the utmost increase in the efficiency of public production allows the CMEA countries not only to keep up, but also to increase the leading growth rate of the given index as compared with the developed capitalist countries.

Of all the factors determining the growth rate and the level of labour productivity, the effect of the changes occurring in the branch structure of social production is specially examined in the work, and also the effect of certain non-investment factors. There are two

aspects to the structural changes: macrostructural changes and changes within the branch structure. Calculations confirm the conclusion that macrostructural changes have played a particularly important role in the organisation of the social productivity of labour.

The specific features of the present stage in the development of the CMEA countries' economies consist in the change-over to more intensive forms of economic activity on the basis of the more efficient use of production resources connected with the growing demand for capital investments and with the need for the accelerated restoration of basic funds. Therefore the role of embodied labour is growing considerably in guaranteeing economic growth, and it should be realised primarily through the indices of the effectiveness of its use.

Elucidation of the questions connected with the increased effectiveness of capital investments and basic funds does, of course, include an analysis of some general problems: norms of accumulation, the dynamics of accumulation funds, the ratio between the accumulation fund and the consumption fund, and others. The authors note that guaranteeing a high economic growth rate in the CMEA countries up till the present time has in many ways been facilitated by the rapid increase in the volume of capital investments, and that this factor will continue to play an important role in the future, too.

The tremendous scale of the capital investments allocated by the CMEA countries every year for their economic development and the very considerable amounts of accumulated funds make it exceptionally important to use capital investments and basic funds more effectively. The authors come to the correct conclusion that cutting down building time and completing those buildings under construction, barring over-expenditure in capital investments, improving material incentives to speed up construction work, achieving correct ratio between the allocations for reconstruction and those for new construction, and a better capital investments structure, developing and improving the system of managing the investing process and so forth, allow the effectiveness of capital investments to be raised considerably.

The measures taken over the last few years have been directed more and more towards the elaboration (at various levels in the economy) of comprehensive plan-programmes for capital investments, the use thereof, maintenance and major repairs, replacement, renewal, expansion, and departure of basic funds. It should be added that the realisation of the above-mentioned measures urgently requires a systems approach to the management of this extremely important sphere of the activity of the CMEA countries. The book deals extensively with the creative activity of the Communist and workers' parties in mobilising all the reserves to achieve increased efficiency of the socialist economy by improving methods of socialist economic management.

The authors end their analysis of the main problems with regard to the reproduction with a description of the main features of the interrelation of production and consumption in the CMEA countries and of the place of public demand in the system of expanded socialist reproduction.

The present-day requirements of the development of the productive forces make possible and necessary a more profound turn of the socialist

economy towards the solution of the diverse tasks involved in raising the population's standard of living. When describing the high growth rate of the consumption funds inherent in the CMEA countries, the authors note the clear-cut tendency to equalising the levels of popular consumption in these countries. The dynamics of consumption of individual kinds of material benefits demonstrate the social purposefulness of the policy being carried out in the countries of the socialist community to attain a high consumption level, above all with regard to the necessities of life and benefits which are decisive in creating a rational and healthy way of life for people.

Research into the processes of the steady growth of real incomes of the workers reveals general tendencies in all CMEA countries for the wages to draw together in the various branches of the national economy, and also of the more and more rapid growth in incomes from the social consumption funds which play an important role in the system of regulating the differentiations in the population's incomes. At the same time, it is noted that equal satisfaction, irrespective of the level of incomes, of the socially important demands of the population in the socialist countries in the field of health, education, culture and social assistance to the incapacitated, through the system of social consumption funds is a great advantage of socialism.

The achievements of the socialist countries in drawing together the income levels of the two friendly classes in socialist society, the workers and peasants, particularly emphasise the social aspect of the population's increased incomes. The Communist and workers' parties of the CMEA countries consider that the solution of more and more diverse problems in raising the standard of living requires planned changes in the most important ratios of socialist reproduction. In drawing up programmes to raise the population's standard of living, more and more thought is being given to the rapid development of those sectors of the economy whose activity serves as the main source of consumer reserves.

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История дипломатии, том IV, *Дипломатия в годы второй мировой войны* (под редакцией А.А. Громыко и других), М., Политиздат, 1975, 752 стр.

A History of Diplomacy, Vol.IV. *Diplomacy in the Years of the Second World War.* Edited by A.A.Gromyko *et al.*, Moscow, Politizdat Publishers, 1975, 752 pp.

The volume under review contains interesting and thoroughly documented historical material relating to the period of the Second World War.

It shows how in the very complicated international conditions of a world war Soviet diplomacy, consistently upholding the principles of the Leninist foreign policy, prevented the isolation of the Soviet state and the formation of a united anti-Soviet front of the forces of international reaction, and how it secured the establishment of a broad anti-Hitler coalition with the participation of Great Britain and the United States, which to a great extent contributed to the victory over fascism.

Despite the difficulties arising from the considerable differences in the viewpoints of the Soviet Union and its Western allies in the anti-Hitler coalition regarding the aims of the war and the ways of ensuring the post-war peace, the cooperation of states belonging to different socio-economic systems was successfully carried out in the interests of delivering mankind from the threat of barbarism.

Overcoming the bitter resistance of the reactionary anti-Soviet forces, Soviet diplomacy worked tirelessly to achieve that the liberating aims of the war and democratic principles of the post-war peace settlement be duly reflected in international actions and documents, in full accordance with the decisive contribution that had been made by the Soviet Armed Forces and the entire Soviet people in the defeat of Hitler Germany and its allies and satellites.

The book gives a detailed description of the significant landmarks in the diplomatic struggle, beginning with September 1939 and up to August 1945. Shown are the fatal consequences of the Munich policy of the bourgeois-democratic states, the emergence of two groups of belligerent powers, the Soviet Union's efforts between 1939 and 1941 to bring about collective security and check the fascist aggression and later, after Hitler Germany's attack on the USSR, the consistent efforts of Soviet diplomacy to bring about the establishment and consolidation of an anti-fascist front. The Anglo-Soviet Agreement of July 12, 1941, the Anglo-Soviet Treaty of Alliance of May 26, 1942 and the Soviet-American Agreement of June 11, 1942 laid the beginning of the formation of a broad anti-Hitler coalition which was joined later by fighting France, and the patriotic forces of Poland, Czechoslovakia, Yugoslavia and of many other countries.

The volume contains a detailed account of the work and important political results of the conferences of the Big Three — the USSR, the USA and Great Britain — in Teheran, Yalta and Potsdam.

Viewed as a whole, the book is a valuable new contribution to the Marxist-Leninist historiography of the Second World War. The history of the establishment, development and activity of the broad anti-fascist coalition in the war years is exceptionally interesting and most relevant.

The creation of this coalition was by no means accidental. It was conditioned by the objective development of the international situation following the fascist aggression. The predatory actions of Hitler Germany, fascist Italy and militarist Japan created a direct threat to the vital interests of the Soviet Union as well as to a large circle of other states belonging to the capitalist system, including Great Britain and the United States. In pursuance of its predatory policy, fascism attacked one country after another, which fell victims to the aggressors.

By the time of Hitler Germany's attack on the USSR in the summer of 1941, these actions of the fascist aggressors had remained practically unpunished. The nazis took advantage of the passivity of their opponents — the bourgeois-democratic

states—which was caused by the shortsighted and self-seeking policy of their ruling classes. The material and man-power resources of these states in the aggregate far exceeded the corresponding resources of the countries of the fascist bloc. But these resources were not drawn upon.

By the summer of 1941, the Hitler armies had overrun a large part of Western, Central and Southeast Europe. There was a direct danger of further fascist seizures and particularly of the invasion of the British Isles by the aggressor.

The US Armed Forces had not been totally mobilised and the United States still remained formally neutral.

Although the peoples on the territories occupied by the Hitlerites had launched a struggle against the invaders, and in some countries (Yugoslavia) organised people's liberation armies were already operating, the situation in the summer of 1941—before the entry of the USSR into the war—was a crucial one on the whole. There appeared to be no real force capable of barring the further advance of the aggressor and of repulsing him effectively.

Despite the load of anti-Soviet prejudices, the most farsighted leaders of the United States and Great Britain realised that to fight the fascist aggressor it was necessary to act in alliance with the Soviet Union. This was dictated by the entire international situation, which was witnessing an objective polarisation of forces—those siding with the aggressor, and those coming out against him. Of course, there were many difficulties on the way to the establishment of an anti-fascist coalition, difficulties which stemmed primarily from the opposition of two social systems, to one of which the USSR belonged, and the USA and Great Britain to the other.

For the ruling classes of the capitalist countries the main aim of the war was to put their most dangerous competitors, imperialist Germany and its allies, out of action. The broad masses and the progressive public of Great Britain and the United States, on the contrary, advanced and upheld anti-fascist liberating aims in the war. But those aims did not determine the government policy of the said states and therefore progressive public opinion there had to bring constant pressure to bear on the ruling circles.

In Great Britain and the United States, these ruling circles for a long time barely concealed their hostile attitude to the socialist Soviet Union. Continuation of the bankrupt Munich policy in regard to the USSR was designed to see the latter seriously weakened as a result of the war. Throughout the war, this reactionary tendency was apparent in certain actions of the Western Allies. But the logic of waging war against a common enemy demanded the establishment of genuine cooperation of all the sides interested, in one way or another, in the defeat of Hitler Germany and its allies. Irrespective of the likes or dislikes of certain circles, objective necessity dictated coordinated actions by the USSR, Great Britain, the United States, fighting France and the other countries defending their freedom and independence, to counter the monstrous military machine of Hitler Germany.

The establishment of the anti-Hitler coalition showed the real possibility and advisibility of military cooperation of states, belonging to

different socio-economic systems, in the interests of curbing the aggressor and delivering mankind from the common danger threatening it.

The great merit of Soviet diplomacy, guided by the Leninist Party, was its consistent, profoundly principled and, at the same time, flexible policy aimed at strengthening the broad anti-fascist coalition and at making the maximum use of the Allies' resources and possibilities to hasten victory over the enemy. The difficulty of the task was that account had to be taken of differences in views that sometimes surfaced among the Allied states on certain issues. Persistence and firmness had to be shown in those instances when there was a direct danger of coordinated military measures being jeopardised.

In the course of the Second World War, the people in Great Britain, the United States and in other countries had the opportunity to convince themselves not only of the staunchness and measureless heroism of the Soviet Army, but also of the high degree of organisation of the Soviet state, and the strength of the socialist social system. Many of the anti-communist prejudices fell to the ground and the truth about the Soviet Union spread. Despite all efforts of the reactionary elements in the ruling circles of the United States and Great Britain, it was the realistic approach to the problems of war time and post-war cooperation with the Soviet Union that ultimately prevailed.

Although the brunt of the struggle against Hitler Germany and its military defeat fell to the lot of the Soviet Armed Forces, the Western Allies contributed their share to the victory. The military operations of the American, British, Canadian and French troops, and particularly the opening of the Second Front in June 1944, made for the common victory. American and British deliveries of arms and military equipment to the Soviet Army although relatively small in proportion, covering less than four per cent of the Soviet Armed Forces' requirements, were of undoubted importance for strengthening Allied ties. News of Soviet victories was always enthusiastically received by the working class and progressive circles in the West.

Historical experience shows that the anti-Hitler coalition in the Second World War played an important and progressive role, ensuring effective cooperation in the common struggle of the peoples and states of different social systems. This positive experience proves that such cooperation, already tested in the difficult conditions of war, can just as successfully be carried out in peace time, particularly if such cooperation is dictated by a common desire to prevent wars and the misfortunes and destruction they bring in their wake.

A study of the positive experience of the anti-Hitler coalition is particularly relevant in the present international situation when favourable conditions are emerging for constructive action in precisely this direction.

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История Кореи (с древнейших времен до наших дней). Редакционная коллегия: академик Б. Гафуров и др. М., Изд-во «Наука», 1974. т.1, 470 стр.; т. 2, 480 стр.

A History of Korea (From Ancient Times to the Present), Editorial Board: Academician B.Gafurov *et al.*, Moscow, Nayka Publishers, 1974, Vol. 1, 470 pp.; Vol.2, 480 pp.

Soviet historical science has in recent years been enriched by many new serious researches into the history of the peoples of the East who have become active makers of world history. Among these researches the two-volume *History of Korea,* prepared by the Institute of Oriental Studies, USSR Academy of Sciences, will undoubtedly occupy an important place. It is the most comprehensive and complete publication on the subject ever to appear in the Soviet Union.

The reader will gain a clear picture of the entire process of the formation of contemporary Korean society—from the times of ancient fossil man on the Korean peninsula, of isolated traces of paleolithic man, of neolithic settlements, the Bronze Age, etc., up to the early 1970s.

The authors explore in detail the development in Korea of the first class society, the formation of feudal relations and of the first feudal states, the creation of a united Korean centralised feudal state and its decline, Korea's transformation into a colony of Japanese imperialism. The concluding chapters of the work are devoted to the contemporary history of Korea in the period between the two world wars and after the end of the Second World War.

Guiding themselves by the Marxist teaching on socio-economic formations as the methodological principle in recreating the history of Korea the authors debunk the various anti-scientific concepts held by the apologists of colonialism and bourgeois nationalism.

Special attention is focused on an examination of the effect of external factors (conquests, the influence of neighbouring states) on the history of the Korean people. On the basis of archaeological excavations, of a study of a large number of written monuments and a critical appraisal of the works of different historians (including Chinese, Japanese and Western), the authors have explored the question of whether these factors have made for Korea's progressive and genuinely national development.

The liberation struggle of the Koreans dates back to earliest times. Ancient Choson was the first political union in the Korean peninsula. At the beginning of the 3rd century B.C. it was attacked by the Chinese state of Yen losing much of its land to the latter. When the Chin Dynasty held sway, Pu, the ruler of Ancient Choson, led a military expedition to win back the western lands of his country that had been torn away by China but suffered defeat. After the unification of China in 206 B.C. under the Han Dynasty, Ancient Choson continued to lose its lands and ultimately fell under the yoke of the Han conquerors at the end of the 2nd century B.C. The native Korean tribes, however, did not submit to the conquerors and waged a courageous struggle against the Han yoke. In 12 B.C. the Koguryo tribe rose up against Han supremacy and put an end to it.

The early Iron Age in Korea was influenced by the Chinese culture of the Han and post-Han periods. One cannot but agree with the authors that an assessment of the results of cultural contacts is not just a matter of establishing the proportion between what is native and what is foreign. It includes verification of the vitality of culture, its capacity to enrich itself by assimilating foreign cultures without losing its own essential features. Korean culture has demonstrated its viability in this respect. The peninsula's outlying position on the continent undoubtedly contributed to its comparatively smooth and isolated development although not as isolated as in the case of Japan in primitive times. It was not engulfed by the Scythian-Siberian or Han cultures, the migrations of the Eastern Mongoloids or Malays—they all only slightly impinged on it. As a result, the proportion between influence and autochthony, between the migrations and the indigenous population proved to be a favourable one for Korea, more so than for Manchuria, and enabled the Korean tribes with the advent of the Christian era to enter the epoch of state building.

This took place, in the opinion of a number of historians (opinion is divided), between the 1st century B.C. and the 4th century A.D. The unification of the Koguryo tribes led to the formation of the state of Koguryo. In the second half of the 3rd century A.D. a second Korean state took shape—Paekche with its capital in Pyongyang. By the 4th century Silla became the third powerful Korean state. The three states waged a struggle for the unification of the whole of the Korean peninsula under the supremacy of one state.

The unification of China under the rule of the Sui dynasty which created a vast military-bureaucratic state led it to predatory, but unsuccessful, wars against Koguryo. A detailed study of the intricate chain of events in the struggle of the Korean people against foreign invaders in the 6th-7th centuries enable the authors to arrive at the well-grounded conclusion that the feudal dynasties of united China seriously complicated the struggle of the three early feudal states of Korea for unification of the country.

The long struggle of the people against the Chinese conquerors ended in the unification of Korea under the rule of the state of Silla. This unification marked an important historical stage in the formation of a single Korean people. With the establishment of the unified state of Silla, the authors conclude, there took shape a compact ethnic, language and cultural community which served as the foundation for the subsequent formation of a single Korean nation with its own distinctive culture.

The authors who have made a penetrating analysis of a wealth of historical material refute the misleading versions of Korea's history, according to which the Korean nation took shape and developed under the decisive influence of neighbouring Japan and China.

The weakening of the first Korean centralised feudal state was caused by the growth of new powerful feudal lords and the general uprising of the year 889 against the intensification of feudal oppression. Silla disintegrated into numerous feudal principalities.

The second centralised state in the Korean peninsula—Koryo with its centre in Pyongyang—arose at the end of the 10th century. It had to

wage a struggle against the Khitans, who had seized a large part of North China and who in 946 proclaimed the founding of the Liao Empire, to hand over to it the vast northern lands and recognise vassalage to it. In the first half of the 13th century the feudal lords of Koryo entered into an agreement with the Mongolian invaders who after conquering China created a vast empire under the Yuan Dynasty. In the 14th century Korea was in vassalage to the Ming Dynasty which ruled China after the Mongol Empire broke up. The sending of tribute to China as a symbol of allegiance was implied in the concept "sate" (service to the elder). This concept was a Confucian standard of what the diplomatic relations of small countries should be with their big neighbour China. As a rule, this symbolic recognition of vassalage did not entail the "vassal's" loss of independence in internal affairs or foreign relations; what was implied was a certain moral disparagement.

The 16th century and the first half of the 17th century saw the weakening of the Korean centralised state. This was due to feudal exploitation, the mounting discontent of the masses, the sharpening class struggle and the intensification of strife within the ruling feudal class.

The weakening Korean feudal state proved incapable of preparing the country for defence against the threatening Japanese invasion which in 1592 assumed enormous proportions. The Korean people, however, rose up to fight a liberation war. They formed a home guard which displayed miracles of courage in the struggle against the Japanese, forcing them to withdraw from Korean soil.

The Japanese invasion brought in its wake great sacrifices, destruction and a decline in Korea's productive forces. A major consequence of the war was that it greatly strengthened the Churcheng state in Manchuria, which began to make systematic raids into Korea. The struggle continued up to 1637 when Korea was compelled to capitulate to the Manchus, who made Korea break with the Ming dynasty. Korea became a vassal of the Chin Manchu dynasty which established its supremacy in China in 1644.

The facts cited in the book on the history of Korea in the Middle Ages conclusively show that the whole of this history was, in effect, an epic of continuous struggle against foreign invaders and in defence of the right to an independent national existence.

The advent of modern times found Korea isolated from the outside world. Beginning with the 19th century the feudal mode of production in the country could already no longer ensure the growth of its productive forces. Like China, Korea attracted the capitalist powers of the West as a market for industrial goods and as a source of raw materials, as well as a spring-board for aggression against the Asian countries. The invasion of foreign capital into the peninsula began in the 1870s. Japan who, after the Meitsi revolution, took the path of capitalist development was nurturing extensive expansionist plans. It was backed in this by the United States and Britain who sought to weaken tsarist Russia's positions in the Far East and to establish their own influence there. A tangle of contradictions arose between the Western capitalist powers, Japan and tsarist Russia in the Far East. After Russia's defeat in the war with Japan (1904-1905), the latter occupied Korea and in 1910 annexed it.

The Great October Socialist Revolution produced a powerful echo in the countries of Asia, including Korea. The second volume of *A History of Korea* gives a picture of the people's liberation struggle in the country beginning with 1917. The communist movement there emerged in the first half of the 1920s. The authors devote many pages to it and give a profound analysis of the working-class movement and of the class actions of the Korean proletariat.

The new factor that changed the character of the liberation movement in Korea was the armed struggle of Korean patriots in Manchuria. It was launched in 1932 by a partisan detachment formed by Kim Il-sung of Korean settlers on the territory of north-east China. In 1934 the Korean People's Revolutionary Army was formed. It often operated together with Chinese partisan detachments.

During the Second World War Japanese imperialism assigned colonial Korea the important role of being its military-industrial base. The number of Japanese enterprises in the country increased considerably during the war years. In 1945 the Korean working class numbered more than two million persons. They constituted a decisive force in the struggle against the Japanese colonialists, a force capable of heading the people in the struggle for a new, independent and genuinely democratic Korea.

The liberating mission of the Soviet Union in the Far East in the Second World War years did not end with assistance to the peoples of the Far East in delivering them from the external enemy—foreign imperialism. It pursued another important objective—that of furthering social progress and revolutionary changes in the broadest sense. The authors of Volume Two examine in detail the conditions that were created after the liberation of Korea in 1945 for the revival of the country by its democratic forces. The landing of American troops in September 1945 in South Korea complicated the political situation in the country and hampered the implementation of the Cairo (1943) and Potsdam (1945) agreements on the establishment of an independent Korean state.

In the chapters that follow, rich in factual material, the authors unfold a picture of the truly sweeping changes that have taken place in the Korean peninsula following the establishment of the Korean People's Democratic Republic in 1948, of the liberation war of 1950-1953 in which the KPDR upheld the right to its existence and to build a socialist industrial-agrarian state in North Korea, how in 1961-1970 the republic passed on to the full-scale building of socialism and how, under the leadership of their Workers' Party, the people in a historically short period changed the face of their country in the north.

The volume under review shows that the Korean People's Democratic Republic is fighting unremittingly for the peaceful settlement of Korea's reunification and for a lasting peace in Asia.

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Первобытное общество. Основные проблемы развития. М., изд-во «Наука», 1975, 285 стр.

Primitive Society. Fundamental Problems of Development, Moscow, Nauka Publishers, 1975, 285 pp.

The team of authors of this collective work of the Institute of Ethnography of the USSR Academy of Sciences (Editor-in-Chief A.Pershits) includes Soviet scholars in various disciplines—from anthropology to sociology and philosophy. To a large extent this makes the work comprehensive, covering the entire range of aspects in which the history of primitive society can and must be studied.

The authors analyse such important from the general methodological point of view problems as the anthropogenesis, sociogenesis, rise and development of the communal-clan system, the mechanism of the formation of classes, and the highlights of the development of primitive societies in their interaction with class societies. This is perhaps the first work in Soviet literature on the history of primitive society that has such a wide historical and geographical range.

The emergence of man and society is the subject of Chapter One (author V.Alexeyev). The discoveries of recent years, chiefly in East Africa, have made the problem of the borderline between animals and man unprecedentedly acute. For instance, some scholars (V.Yakimov, Yu.Semyonov) classify such beings as *Homo habilis* as an animal, while others (L.Leakey, P.Boriskovsky, M.Uryson) refer them to the category of man. Alexeyev himself is inclined to accept the latter viewpoint, and this is seen in his classification of the family of hominids. This classification is based on morphological indications, and it is systematically compared with phases of the development of stone industry, from which it receives its objective confirmation. The author thus shows that the new paleoanthropological and archaeological finds bear out the immutability of the Marxist understanding of labour as the creator of man. In characterising ancient man's social links the author offers the view, which, while being argumented, remains questionable, that there was no promiscuity in the primitive herd. Drawing upon new information, particularly the studies of G. Schaller and I. Emlen, Alexeyev suggests abandoning the traditional understanding of the birth of social links as the sole instrument of the suppression of zoological individualism.

Central place in this work is occupied by the chapters "Emergence and Development of the Clan System" (L.Fainberg) and "The Disintegration of the Primitive Communal System and the Rise of Class Society" (A.Khazanov). These chapters are a study of a long phase of the development of primitive society—from the crystallisation of human society to the appearance of antagonistic classes. The authors do not confine themselves to generalising available data on such cardinal problems as the prerequisites, time and forms of the rise of the clan, the correlation of the clan, commune and family, the consecutive phases of the development of the clan system, the conditions of the disintegration of primitive-communal relations, the birth of antagonistic social classes and the origin of the first state formations, but in some cases they suggest original solutions for disputed problems. For example, they offer the consideration that during the Middle Paleolithic there were local pre-clan and clan communities, and that this was a concrete expression of the unevenness of historical development. We tend to agree with them that the conclusions about the preclan and early clan communities of the close of the Middle and early Upper Paleolithic drawn on the basis of data on backward ethnographic groups are methodologically erroneous. Further, we feel attention is merited by the thesis that the attempts started by Lewis H. Morgan to reconstruct the most ancient forms of clans and communes on the basis of present-day hoe-using agricultural clan communes, that are far distant from them both chronologically and by their development stage, are justified (although this is rejected by some modern investigators). Much of Morgan's data and assumptions retain their significance to this day.

In considering the later stages of the clan system, the authors justifiably focus special attention on the economic reasons of its disintegration—the appearance of a regular surplus product, the spread of exchange and the social division of labour. In recent years there has been an extensive discussion in Soviet science over which of the two factors of the formation of antagonistic classes noted by Engels—through property inequality or through social differentiation—predominated in the epoch of the formation of classes. One can agree with the opinion, given in the book, that although one of these two factors could be more pronounced in some specific societies, they are only two inter-related sides of one and the same phenomenon, and that it is therefore difficult to separate one from the other.

In their analysis of how the clan-tribal aristocracy appeared, the authors take into account the simultaneous operation of economic, functional and genealogical factors, but note the priority of economic reasons. In this area too, as in the scrutiny of questions related to anthropogenesis and sociogenesis, new ethnographical material confirms the Marxist teaching on the primitive epoch.

For a long time essentially primitive societies existed side by side with societies in which there were class relations and the corresponding superstructural phenomena; the relations between them were complex and many-faceted. For that reason the question of a centre's links with outlying regions is of considerable theoretical importance in the history of mankind. This importance persists also because in some modified forms this problem exists today in a large portion of the Third World. For that reason we feel that the inclusion of two chapters on the primitive outlying regions is justified. The chapter written by A.Khasanov with the participation of L.Kubbel and S.Sozina deals with the primitive outlying region of pre-capitalist society, and the chapter by I.Andreyev and L. Fainberg traces the destiny of primitive outlying regions in modern and latest times.

During different periods of the history of human society, we learn from these chapters, the relationship between the centre and the outlying regions had both common features and tangible differences. Whereas the centre influences the outlying regions in all cases (borrowing from the centre in the sphere of technology, ideology and socio-political organisation), the outlying regions do

not always influence the centre. The authors believe that with the widening of the development gulf between societies of central and outlying regions the latter's significance in their mutual relations steadily declines. Whereas a slave-owning society can hardly be imagined without a primitive outlying regions supplying it with its principal productive force, under feudalism the existence of outlying regions was not an indispensable condition but only an additional unfavourable factor of socio-economic evolution. However, in both cases a certain possibility is preserved of the outlying regions actively influencing the centre. However, with the appearance of the capitalist mode of production in some countries the character of the interconnections undergoes a fundamental change: the outlying regions become exclusively a passive object of exploitation.

The question of the possibility of utilising the traditional socio-economic and socio-political institutions of outlying societies under conditions of their non-capitalist development and the question of the forms of such utilisation of these institutions are raised in an extremely interesting way. These questions are considered in the closing chapter on the basis of data on the numerically small nations of the Soviet North and Far East and individual African countries that have adopted the socialist orientation. The inclusion of these sections in the book shows how important from the methodological and practical point of view Marxist-Leninist elaboration of the problems of primitive society is for understanding ethnosocial and national relations in the modern epoch.

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НЕЧКИНА М.В., *Василий Осипович Ключевский. История жизни и творчества.* М., изд-во «Наука», 1974, 638 стр.

NECHKINA M.V., *Vasily Osipovich Klyuchevsky. His Life and Work*, Moscow, Nauka Publishers, 1974, 638 pp.

This book by Academician M.Nechkina is a new contribution to Soviet studies of Russian historical science, in the monographic study of the life and work of its leading men. The appearance of this book is a natural development both for our historiography and for the work of Academician Nechkina herself. It could have been created only after the writing of the course of the history of the USSR, and only after painstaking collection and study of the texts (or preparation for the press) of the vast legacy of V.Klyuchevsky (1841-1911). It was quite natural for M.Nechkina to have written this book because for years she has been at the centre of these extensive historical, historiographical and archaeographical studies.

The first chapter describes how Klyuchevsky's works were studied. It is based on a vast amount of material, collected over a half-century, and showing the intricacies through which Klyuchevsky's legacy has gone in Soviet and in bourgeois historiography. In bourgeois historiography Klyuchevsky was considered the founder of the scientific school of Russian historiography, his name was the banner of academic science, first in Russia, and after the October Revolution and the split of

the Klyuchevsky school into two camps, in Russian émigré historiography; the modern bourgeois historiographical writings seek to contrast Klyuchevsky as the summit of science in Russia to Soviet historiography.

M.Nechkina's book cuts at the roots of the speculations based on a presentation of Klyuchevsky as standing over and above the struggle, outside of politics, non-partisan scientist. The author shows that Klyuchevsky's approach was partisan approach through and through, but that he was frequently powerless in his methodological efforts to the same extent that he was great as a penetrating analyst. This determines the great scientific and political significance of the work under review.

The monograph contains a historical analysis of Klyuchevsky's life and work, which is closely interwoven with a presentation of his family circle, scientific environment and the country's socio-political life.

The author shows us the internal content of the process in which a keen-witted student of a theological college in Penza developed into a caustic critic of the Church; an apologist of the state of the nobility into a severe critic of the social parasitism of the gentry; a supporter of the monarchy into a man who produced the historical arguments for the need to overthrow it. This was achieved by the author not only through a painstaking reading of every scrap of writing left by the historian in his lectures, diaries, letters, and aphorisms, through a comparison of what he said, and what others said about him, but mainly through a rare ability to project every fact of the scientist's life and activity onto a social background which has been studied in great detail.

As a recent graduate from the theological college, Klyuchevsky finds himself in the midst of agitated students in Moscow. He finds the young noblemen alien to his spirit, and fears the revolutionary democrats: he is terrified to stand between these two fires, but he is there, and this shaky position ultimately becomes the platform of his life as a scientist. Klyuchevsky cannot be understood, says the author, without this impulse of the 1860s.

The author takes the reader along the stages of Klyuchevsky's creative effort, showing the origination and embodiment of the schemes of all his main works: from his candidate's thesis, "A Foreigner's Reports on the Moscow State" (1866), his master's thesis, "Lives of the Saints as a Historical Source" (1871), his doctoral thesis, "The Boyar Duma in Ancient Rus" (1882), and finally his "Course of Russian History" (1904-1911). That was the course of his life, and it stemmed from his experience of uninterrupted effort in lecturing.

An understanding of Klyuchevsky's creative biography helps materially to enrich the profound analysis of his courses of lectures of the 1880s (not published in his lifetime) such as "Methodology", "Terminology", "A History of the Estates", "Source Studies", "Historiography", "Western Influence in Russia after Peter", the Abastuman course of world history (1893-1895), including a history of America, and finally his second speech on Pushkin (1899). These courses reflect both the historian's strong points and his methodological failure.

The author brings out all the evidence available in the sources on the wealth of his spiritual world, his creative quest and doubts of the historian, who had appeared to have

reached the summit. He was tormented by the absence of "method". For years, throughout his life, beginning with his course on methodology (1884-1885 academic year), he seeks to answer the question of what is historical regularities, and how, by what and where history is impelled to move. Here is a remarkable admission: "Our Russian historical writing cannot be accused of lack of industry.... It has processed a great deal; but I will not be falsely accusing it if I say that it does not know what is to be done with the material it has processed; it does not even know whether it has done a good job in processing it." (M.Nechkina, *Vasily Osipovich Klyuchevsky*, Moscow, 1974, p.260, in Russian). Later, Klyuchevsky temporarily accepted the law of sufficient reason, while arguing that some laws in social life were much more unconditional than astronomic laws, and insisting that "life is like a religious procession. It is vain for those who happen to be in the front ranks of the crowd to imagine that they are leading the rest". (V.A.Maklakov, "Extracts from Reminiscences", *Moscow University, 1755-1930. Anniversary Collection*, Paris, 1930, p.307.)

Taking the powerful figure of Klyuchevsky as an example, Nechkina has revealed very well the meaning of the crisis of bourgeois science. Throughout her book, she scrupulously shows how vainly Klyuchevsky tried to tie in his eclectic historical scheme with the conclusions which sprang from his concrete socio-economic studies and from his socio-political experience. She shows how powerless were his attempts to combine the idea of the state — the idea of universal welfare — with the "nobiliary syllogism" about the illegitimacy of the serf-holding system over the last century of its existence: the nobility itself had been released from various servitudes in 1762, but had retained all the rights earlier based on these servitudes. The author shows how painfully Klyuchevsky pondered on the unity of the Russian historical process, while cutting apart the living fabric of his country's past into mutually unconnected periods — halting places on the way of colonisation — "the Dnieper period", "the Upper Volga period", "the Great Russian period", and "the All-Russian period". She tells us that Klyuchevsky, hampered by his high official post and academic traditions, slyly wrote what he did not think, while expressing his innermost thoughts on the various pages of his diaries and in his aphorisms.

M.Nechkina is a fair historiographer. Having proved Klyuchevsky's theoretical collapse, she then goes on to assert with the weight of her whole book that his bourgeois limitations were a far cry from self-complacency and confidence about his own conclusions; that although he was no historical materialist, his anxious quest for the meaning of history in general, and of Russian history in particular, stirred the souls of his readers and especially of his audiences. In addition, Klyuchevsky was also a great lecturer who appeared to his enchanted audiences to be "a traveller who had just visited past ages and who was telling them what he had himself seen and heard" (Ibid., p.313). The author writes in detail about the vast effort he put into his lectures.

M.Nechkina draws attention to the innovatory aspects of Klyuchevsky's scientific activity, like his great achievement as a source scientist who made a study of almost 5,000 Lives of the Saints; his elaboration of the genesis of the autocracy in

Russia and the changing extent of social participation in running the country, as illustrated by the eight centuries of the Duma. Klyuchevsky contrasted his own "constitutional view" of the Boyar Duma to V.Sergeyevich's "autocratic view", thereby inflicting a heavy and well-merited blow at the formal-juridical school in Russian science. And it is, of course, noteworthy that having traced developments from the Boyar Duma to the reforms of the mid-19th century, a quarter-century later, in the revolutionary year of 1905, at the invitation of Nicholas II he found himself taking part in a conference convened to draw up an institution called the Duma. Klyuchevsky's writings about the Duma, despite his incorrect view of the role of classes, advanced social comprehension of Russia's social history.

To what Klyuchevsky did in the sphere of Russia's social history are fully applicable the words with which he opened the discussion of the dissertation submitted by one of his students, P.Milyukov, when he said: "Your work raises more questions than it provides answers. That is not a shortcoming. Sometimes it is harder to put a question than to answer it, as it is harder to notice a hole than to mend it." [A.Maklakov, op. cit., p.302; about the discussion see V. O. Klyuchevsky, *Works*, Vol.VIII, Moscow, 1959, pp.177-183 (in Russian)]. Klyuchevsky raised many new questions, and found many "holes" in historical science. He was forced cautiously to avoid the "dangerous" materialistic ways by his liberal-bourgeois outlook and by the constant direct and indirect incursions of the police authorities into his personal and scientific life (from 1886 he was under police surveillance, and this continued even in 1897).

In the book under review the new facts and conclusions about Klyuchevsky displace the old and erroneous notions, like the one that Klyuchevsky had dealt exclusively with the history of Russia, when, in fact, in his Abastuman Course he had made one of the first attempts to present the world-historical process with the introduction of Russian topics. Another continuing preconception is that he never went beyond the 17th century in his scientific studies, while his *Course of Russian History* was based on his lithographic lectures of the 1880s. There is no reason, says Nechkina, to break up the foundation of the *Course* into two halves and to let it rest on one of these, ignoring the other. The other is Klyuchevsky's studies of the subsequent period, including his studies on the history of the 18th-19th centuries. This conclusion is based on a strict textological and ideological analysis by the author of the creative history of the *Course*, and the chapter dealing with this is one of the best in the book. The *Course* contains all the flaws of Klyuchevsky's methodology, with its primacy of policy over economy, with virtually no history of the working people, a vague notion of classes, etc. Nevertheless, in Russian science that was the first course with a problem periodisation, and its very nature was alien to both the serf-holding system and the autocracy, so connecting with Klyuchevsky's last articles which he wrote at the age of 70 on his death-bed, in hospital....

Klyuchevsky's influence on the historical science of the 20th century is vast, although his contemporaries, who had no knowledge of his lecture courses of the 1880s and 1890s, or of his diaries and aphorisms, and were not equipped with an understanding of historical regularities, were proba-

bly unable fully to appreciate the fruitfulness of the new trails blazed by the great bourgeois historian. It would probably be interesting to study his specific features within the framework of the world bourgeois historiography and sociology contemporary with his *Course*, where the problems of classes, class struggle, etc., that tormented Klyuchevsky, had long been considered and solved. That is perhaps where we shall find the answer as to why he turned his back not only on historical materialism, but also on bourgeois classical sociology. The question about Klyuchevsky's attitude to the intelligentsia, which is dealt with repeatedly in the book, can apparently still be further considered as part of the problem of the relationship between society and the people, and also between the advanced students and society.

The importance of M.Nechkina's book goes well beyond the limits of the task she set herself. This is a specimen of historiographical research synthesising the long and complicated process of relationship between the creative individual and society. Nechkina's analysis of Klyuchevsky's scientific quest clearly shows the weak sociological basis of landowner-bourgeois historiography in Russia, and the mighty breakthrough into the future effected in our science with the aid of historical materialism.

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ЧУДИНОВ. Э. М. *Теория относительности и философия.* М., Политиздат, 1974, 304 стр.

CHUDINOV E. M., *The Theory of Relativity and Philosophy*, Moscow, Politizdat Publishers, 1974, 304 pp.

Present-day methodological thinking is increasingly aware that the old rigid-deterministic scheme of classical epistemology is far from an adequate reflection of the actual cognition situation. In the new picture of the genesis of theoretical knowledge now taking shape and the subsequent establishment of its authenticity and objective proof a fitting place is being taken up by philosophy, whose heuristic ideas and principles have proved to be variously involved in every element of the real cognition process.

The most convincing evidence of this comes from the history of the origination and development of the theory of relativity. Indeed, it has turned out that this theory is based on a number of epistemological principles and hypotheses which in the aggregate constitute its philosophical implications. In the book under review, these implications are shown through an analysis of two metatheoretical principles: the principle of observability and the principle of simplicity, which, the author says, have had a considerable heuristic role to play in the structuring of the theory of relativity.

The results of thorough scientific historical and logico-epistemological research over the past few years show that the real origination of this theory has been far from simple. The impetus to this retrospective reflection has come from the repeated statements by Einstein himself, which were such a source of perplexity for naive-materialistic and logico-empirico-minded methodologists. He said that in the structuring of

the special theory of relativity Michelson's experiment did not play any role at all, or at any rate, did not have decisive role to play because, said Einstein, he had been convinced on the strength of general considerations that there is no absolute movement at all, so that his whole research task boiled down to combining this with what was known in electrodynamics.

The author tries to sort out in theoretico-cognitive terms the general considerations on the basis of which the principles of the special theory of relativity were formulated. Justly assuming that these consisted of definite epistemological propositions, the author points first and foremost to the principle of observability. The author believes that the meaning of this principle for epistemology in general terms amounts to the following: the principle of observability expresses the requirement that the theoretical should be tied in with the empirical, and not just a tying-in of theory with the observable magnitudes, but that the tying-in should involve the primary concept of the theory. Furthermore, because various physical theories have different systems of primary concepts, immediately linked with practice, there is no observability principle which is common for the whole of physics, just as no physical theory can claim a monopoly right to its substantial interpretation.

Let us note that Einstein himself took a highly restrained view of the observability principle. This fact calls for special circumspection in any logical reconstruction of Einstein's thinking and his structuring of the special theory of relativity. Thus, the elimination from the conceptual structure of physics of the concept of absolute time may be interpreted not only as a cognitive act in accordance with the requirements of the principle of observability, but equally as a typical instance of operationalist analysis (no wonder Bridgeman considers the special theory of relativity as the natural-science premise for the philosophy of operationalism). This produces the need for a special conceptual analysis of the problem situation, because everything depends on the view taken of what is *observable*. If the latter is characterised as an experimental-measurement magnitude with an indication of the real experimental situation and a description of the experimental installation involved, the concept of what is *observable in principle* coincides with what is *operationally defined*. This, for its part, produces a number of subtle questions bearing on the relationship between the principle of observability and the operationalist criterion of the meaning of concepts. They have been regarded as identical by some authors. Meanwhile, Bridgeman himself has refused to have anything to do with the principle of observability (in its initial Heisenbergian interpretation, at any rate). In this context, it appears that the author's critique of operationalism would have been much more concrete and effective, if it had been tied in with an analysis of the narrowly empirical interpretation of the principle of observability as produced by early neopositivism. Besides, this logical analysis would have made it possible to produce a more precise epistemological characteristic of the principle of observability and, accordingly, in the context of the evolution of the concept of this principle among the leading physicists to specify its real heuristic potential, thereby determining its position within the system of the

methodological principles of modern physics, and also to bring out more clearly the actual weaknesses of operationalist methodology. Thus, the author, when dealing with the operationalist interpretation of the criterion of physical meaning, reduces it (after Einstein) to the requirement of "a separate empirical verification of every assertion of physical theory".

At this point there is need to emphasise that Einstein himself, when dealing with the need for empirical verification only of the consequences flowing from theory, drew attention to the fact that "experimental verification" is a property not only of the given *assertion* but also of the *concepts*, included in that assertion, as related to practice, and these are, in effect, different things. Furthermore, Bridgeman's use of the term "operational verification" is *broader* in content than the conventional term "empirical verification" because operation implies not only *experimental* operation but also paper-and-pencil operation, that is, purely *logical* action (as applied to the operational interpretation of mathematical and abstract physical concepts).

Finally, latter-day operationalism (taking 1936 as a starting point, when Bridgeman's book, *The Nature of Physical Theory*, appeared) did not in any sense insist on a separate empirical verification of *every* assertion of physical theory. On the contrary, in his polemics with orthodox interpretations of the principle of observability, Bridgeman opposed any attempts to produce direct and concrete correlation of *all the elements* of mathematised theory.

In this context, there is also need to specify Chudinov's generalised conclusion concerning the relation between the philosophy of operationalism and physics, when he says: "Conceived as a programme for establishing closer links between physical theory and experiment and for overcoming the *a priori* approach, it leads to the opposite results: *to subjectivism, to a denial of the objective content of physics*". This conclusion must have been based on the tendency towards individualising operations with the consequent accent on their uniqueness, which leaped to the eye in Bridgeman's early research. Later on, Bridgeman specially emphasised that operations were repeatable and identifiable and, hence, also *objective*. Some students of operationalism who consider the latter not as a special theory of semantic rules of the connection between theoretical terms and the predicates of observation (that is, a theory akin to the reductionist conception of knowledge in neopositivism), but as a more general theoretico-cognitive doctrine, reasonably regard it as an attempt to analyse scientific creative effort, which, however, proves to be justified only for one research situation, which is called "man-instrument".

As for the principle of simplicity, to which the author devotes special attention alongside the principle of observability, let us note, first of all, the specific approach to the question itself. In present-day methodological writings, the principle of simplicity is mainly considered in connection with the problem of selection of formulated conceptual systems. But Chudinov has a different purpose: through a philosophical comprehension of the origination of the theory of relativity, he wants to bring out the constructive potentialities of this methodological fundamental principle in the shaping of a new system of knowledge in general.

Researchers, when dealing with semantic simplicity, as a rule make a definite ontological assumption about the simplicity of the material world itself, a tradition that can be traced from Newton to Einstein. But the other view is that the world in itself is not simple, although science seeks to simplify its descriptions. The author of the book under review believes that the principle of simplicity successfully serves the purposes of scientific knowledge and has fulfilled a heuristic function to the extent to which it has reflected a definite aspect of the objective world. Considering the question of the objective basis of the principle of simplicity in the context of dialectical categories like the general and the individual, the author reaches the following conclusion: "The world, taken as an aggregation of all its phenomena, is not simple in Ockham's sense of the word. But it does have an objective aspect of simplicity — the objective laws which are expressed through objective complexity, the phenomena of the real world."

On the whole, without objecting to this conclusion, I should like merely to point out another and more general aspect of the problem. The traditional view of the simplicity of the world as its internal harmony or the conformity of natural phenomena and processes to laws, which lies at the origins of the empirical method and which has had a definite heuristic role to play in developing natural science, reflects only *one*, even if highly important, aspect of the matter. After all, the scientific description of nature includes not only laws which are associated with *simplicity*, but also the *initial conditions* which may be regarded as embodying the *complexity* of the world's structure. The simplicity and complexity of nature could be expressed in the idiom of fundamental cosmological conceptions of the homogeneity and heterogeneity of the world which is expressed not only on the level of phenomena but also, one would assume, on the level of substance. From this standpoint, the world appears as a unity of the properties of homogeneity and heterogeneity, which, for its part, is expressed in epistemological terms in the dialectics of the category of necessity and chance.

That being so, the true meaning of simplicity is brought out only on the level of epistemological analysis, when it is comprehended as a special category of the methodology of science.

A positive aspect of the book is that in it the concrete epistemological analysis of the principles of observability and simplicity is not paramount, but is aimed at solving a more general problem, that of comprehending the ways in which the philosophical basis of physical science is shaped. The author, taking the formation of the theory of relativity as his example, shows that the impact of philosophy on physics is expressed not only in the interpretation of the latter's concrete results, but also — and this is important — in the formation of philosophical hypotheses bearing on the principles of physical science. It would appear that a real premise for including this general principle in the basis of physical theory should consist in the philosophical system within whose framework this fundamental principle has been most adequately interpreted. However, the origination and development of the fundamental theoretical conceptions of the 20th century show that the assimilation of philosophical ideas by science is far from being so straightforward. The

starting methodological principles of the new physics were, in effect, created by the scientists themselves by the trial-and-error method by which they were guided in their research. Of course, this process was not in any sense something totally isolated from the general intellectual background of the epoch which had taken shape under the impact of traditional philosophical systems, but their fundamental epistemological propositions, which determined the style and method of scientific thinking in general, were in effect, shaped under the impact of circumstances that were largely accidental from the standpoint of the logic underlying the interaction between philosophy and science.

From this angle, the author analyses in detail the relationship between the methodological principles of the theory of relativity and the philosophical conceptions of Hume, Mach and Kant. He shows the evolution of Einstein's assessment of these philosophers' scientific and methodological ideas. I have found especially interesting his analysis of Einstein's attitude to Hume and Mach, for his initial uncritical acceptance of their empirical philosophy necessarily had a negative influence on the work of the young scientist. Unfortunately, the author has not considered the philosophy of Spinoza, under whose direct influence Einstein worked throughout his life. Such an analysis would have largely helped to clarify the true philosophical motives of Einstein's approach to the cosmological problem, which in the book are somewhat obscured by an overstated assessment of the role of Mach's principle.

These remarks do not, of course, make any difference to my high assessment of the book as a whole, which contains an analysis and systematisation of an abundance of material on the meaningful philosophical problems of the theory of relativity.

A. Tursunov

RYABCHIKOV A., *The Changing Face of the Earth. The Structure and Dynamics of the Geosphere, Its Natural Development and Changes Caused by Man*, Moscow, Progress Publishers, 1975, 206 pp. (in English).

In his book A. Ryabchikov, D. Sc. (Geogr.), the Dean of the Department of Geography at the Moscow State University, has generalised and systematised present-day scientific ideas on the structure and dynamics of the natural environment and the changes made in it by man.

In the monograph the concept of the geosphere is examined as an integral material system, whose dynamic equilibrium is determined today not only by natural factors (solar radiation, the energetics of the tectonic processes, biogenic energy), but by technogenic factors connected with the rapid growth in world production.

In the first part of the book the concepts of the geosphere, landschaft, the energy balance of the productivity of the biosphere are analysed. The historical method used by the author allows us to trace the emergence of natural zones and the stages in their development, and how they took shape during the period of man's active intervention in natural processes.

The second part of the book deals with man's influence on the landschaft, with the issues of population

growth and provision of the population with food, water, oxygen, and mineral resources. The author's research into the natural purification of the geosphere of technogenic wastes, into the state of and prospects for using the resources of our planet, is the first of its kind. His analysis of a wide range of questions is based on the latest sources and on his own calculations. Examining the many complex phenomena in detail and showing their positive and negative sides, the Soviet author favours an active, but wise intervention of man in natural processes. He demonstrates that when natural resources are used scientifically, the natural potential of the landschaft is ever increasing.

For the first time in Soviet literature, the development of anthropogenic landschaft is discussed so thoroughly and extensively. The author considers that present-day landschaft is a complicated territorial combination of slightly changed natural landschaft and of anthropogenic and technogenic landschaft. Moreover, the latter is part of the geosphere. However, man constantly maintains the natural equilibrium in them. On the basis of this study the typification of anthropogenic landschaft is carried out. It reflects the real meaning of the ties between human activity and nature which are objectively brought about by the development of production to satisfy the constantly growing needs of society.

Today science can no longer be limited to just an analysis of the ties with nature. New tasks face it, such as making an integrated study of the effect of man's activities on nature; forecasting the development of landschaft and working out recommendations for the rational use of natural resources. The book by A. Ryabchikov is indubitably a contribution to solving these tasks.

Yu. Yermakov

АНАНИЧЕВ К. В. *Проблемы окружающей среды, энергии и природных ресурсов (международный аспект)*. М., изд-во «Прогресс», 1974, 168 стр.

ANANICHEV K. V., *Problems of the Environment, Energy and Natural Resources (From an International Viewpoint)*, Moscow, Progress Publishers, 1974, 168 pp. (English and French translations of the book are to be published by Progress Publishers, Moscow, in 1976.)

This book is devoted to an analysis of a number of the crucial problems engendered by the scientific and technological revolution which are having a considerable impact upon international relations.

K. Ananichev examines the question of the environment as one indissolubly linked with other "technological" problems of today. Individual chapters of the work deal with the problems of environmental protection and the rational use of natural resources, energy and energy reserves, and also urban development and man's creative activity. The author discusses in detail the state of international cooperation, and its prospects and, in this connection, the question of establishing an international environment monitoring system; the scientific, technological, economic and philosophical aspects of environmental problems are methodologically brought together. K. Ananichev subjects to convincing criticism the concepts of the Club of

Rome, the Project of the Predicament of Mankind, and a number of other Western theories, which are in some way or other connected with the environmental problem. The author brings in examples characteristic of the Soviet approach to the solution of the problem.

A special chapter is devoted to a comprehensive analysis of the use and protection of natural resources; in this chapter the author after commenting on some of the theses in the main works by the noted Soviet scientists A. Fersman and V. Vernadsky, and on the studies by American authors, goes on to analyse concrete facts. Thus, he looks at the extent to which individual countries are provided with natural resources and discusses ways of satisfying the requirements in this area by using the latest achievements of the scientific and technological revolution.

The section of the book dealing with the energy issue and energy resources is most relevant. The author analyses the present situation and the prospects for the development of the production and consumption of various kinds of energy; he also analyses all the known forecasts for the consumption of energy resources in the USA and other capitalist countries.

Cooperation in the environmental protection as a specific problem of scientific and technological cooperation is discussed by the author in all its forms: bilateral (laying emphasis on the development of cooperation between the USSR and USA) and multilateral. K. Ananichev particularly stresses the fact that stable peace and extensive cooperation between states, including states with different social systems, are the main prerequisites for solving problems of the protection and improvement of the environment.

The concluding chapter of the monograph examines the question of an international system for environmental quality control on a worldwide scale. Global monitoring is an important international action carried out by many international and national organisations which use various forms of probes and means of analysing results. In the author's opinion, the dialectical unity of national and international systems of monitoring should, where there is cooperation, lead to an effective pooling of efforts by the states which are taking the first step towards protecting the biosphere of the planet Earth.

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Социальное и национальное. Опыт этносоциологических исследований. М., изд-во «Наука», 1973, 330 стр.

The Social and the National. An Experiment in Ethnosociological Research, Moscow, Nauka Publishers, 1973, 330 pp.

This work is based on the data of sociological studies conducted by a team of researchers in the Tatar Autonomous Soviet Socialist Republic.

These studies cover many aspects of the development of relations between the peoples of the USSR: the influence of the ethnic factor on social processes and phenomena; the social-professional structure of the population in the different constituent republics; the correlation of elements of national and international aspects of culture in social groups; the development of a lingual community and the spread of bilingualism; psychological aspects of relations between nations, and so on.

The changes that have taken place in the socio-ethnical structure of the Tatar Autonomous Republic in the process of socialist and communist construction are dealt with at length. The experience of building socialism and forming a homogeneous social structure in the multinational Soviet Union shows that the basic ways and means of the fundamental changes in the social structure of the nations and nationalities of the USSR come under the operation of common laws. However, these laws did not by any means operate similarly among all the peoples. The building of socialism by peoples who had been subjected to colonial exploitation prior to 1917, the Tatar people being a case in point, gave rise to some specifics and difficulties during the socialist reorganisation of their social structure.

Using facts the authors show that as a result of the consistent implementation of the Leninist nationalities policy, the creation of a modern industrial infrastructure and the acceleration of urbanisation, the formerly backward peoples drew level with the nations of the USSR that had forged ahead in their economic and social development.

An interesting point made in the book is that radical changes in the social structure of the population are accompanied by a growth of social mobility, which, among other things, carries a socio-ethnic load, performing very important functions in the processes of the integration and consolidation of the ethnoses.

The results of ethnosociological studies make it possible to trace all aspects of the social movements and relationships of social groups. The authors show that today the social development of nations is rapidly levelling up and is accompanied by the formation of an entirely new type of contacts between individuals: these contacts are not socially or nationally closed, but are open and based on the ethical and spiritual affinity of individuals.

Considerable attention is given to a characteristic of the trends of the population's socio-cultural development. In the republic a swift levelling up is observed in the structure and character of the consumption of cultural values by Russians and Tatars, in other words, of their cultural life. In the individual social groups this process has its own specifics, but the same level is achieved in each case.

The authors discuss the role of the family as an element of the social structure and a major social institution, and analyse the interaction between the changes in family and everyday relations and the development of relations between nations. Factual material enables the authors to draw the important conclusion that the internationalisation of the forms of everyday life of different ethnoses is intensifying and that ethnical distinctions are being erased in psychology and everyday life. One of the fundamental manifestations of the new quality in the development of family and everyday relations is the growth of the number of mixed marriages.

A nationally-mixed family is an important element of the integration of the culture, everyday life and traditions of different peoples. In such families the cultural level is frequently high, and the more developed cultural environment stimulates the acquisition of more sophisticated cultural habits by children and the growth of the intellectu-

al and cultural requirements of all the members of these families.

After accentuating the inter-individual aspect of national relations, the authors draw attention to the problem of national orientations, guidelines, opinions and behaviour. In studying national guidelines, they take into account the situation in which these guidelines manifest themselves: the production collective, close family contacts, and close friendly contacts with persons of another nationality. The results of sociological studies enabled the authors to draw conclusions about the determinants forming national guidelines and the character of these determinants relative to different types of agglomerations.

An interesting analysis is made of the dependence of national guidelines on mono-national and multinational surroundings. True, this analysis is limited to the place of residence. Labour, which is a major determinant of orientations and guidelines, has regretfully not been taken as a subject of study.

The authors deal profoundly with the problems of ethnolinguistic contacts and bilingualism. They formulate a number of interesting propositions on the essence and social significance of bilingualism, on its influence on the ethnical self-consciousness. Further, they study the importance of the Russian language to the development of relations between peoples.

The Russian language is a major vehicle for expanding social links, it considerably facilitates contact with people of other nationalities and social strata in multinational production collectives and outside the sphere of production. It provides the bridge to new common, Soviet traditions and norms of behaviour.

This by no means signifies the Russification or denationalisation of the non-Russian cultures and languages; on the contrary, it is an objective process and helps to enlarge the scope of common, Soviet elements in all spheres of the socio-cultural life of the peoples of the USSR. The authors stress that the native language and ethnical self-consciousness play a vital role in ethnical processes.

On the basis of their ethnosociological analysis of the processes taking place in relations between nations at the present stage of communist construction, the authors have drawn interesting conclusions on the ways and prospects for the development and drawing together of Soviet nations.

T. Abdushukurov

Герой художественной прозы. Социалистические страны Европы. М., Изд-во «Наука», 1973, 398 стр.

The Main Character in Prose Works. The Socialist Countries of Europe, Moscow, Nauka Publishers, 1973, 398 pp.

This book goes beyond the bounds of its title. It not only deals with the main character in the literatures of the socialist countries of Europe, that is, the problem of the individual, of the structure of character, but that of prose fiction in these countries as a whole. Soviet authors select typical works by Polish, Hungarian, Yugoslav, German (GDR), Czech, Slovak and Bulgarian writers and examine these works in the light of their social, psychological and moral problems; this makes it possible to draw, if only in general outline, a picture of the literatures of the European socialist countries.

Before us we have a series of literary-critical studies linked with the community of questions analysed, which complement one another. As a rule, each of the authors speaks about "his own" literature, the literature he knows best, but he also uses other foreign material: curious and sometimes unexpected comparisons arise, and the main outlines of the international socialist literaty process are revealed. The critics often correlate the books analysed to Soviet literature and note the similarities in them.

The researchers describe new and significant phenomena in the socialist literature of different countries. A. Piotrovskaya examines the original and outstanding novel *Diably* (The Devils) by the Polish writer Tadeusz Nowak; N. Yakovleva makes us think about the philosophical novels of Meša Selimović *Derviš i smrt* (The Dervish and Death) and *Tvrdava* (The Fortress); in his article "The Young Hero in Literature" Yu. Gusev uses a great deal of material, mainly taken from Hungarian prose. As can be seen from the book, prose works in the socialist countries of Europe are characterised by a wealth of genres, themes, varieties of style (epic novel, novels about everyday life in the country, war novels, philosophical novels, tales containing the confessions of youth, satirical tales, autobiographies, and so forth).

The shaping of the socialist character, the introduction into everyday life of the principles of socialist morals which are based on an understanding of the personal concern and responsibility for all that is going on around, is by no means an easy and simple matter. Literature reflects this complicated process and actively participates in it.

"In the spiritual sphere," notes N. Yakovleva, "the conflict between the old and the new is particularly marked. Ideas which have been formed over the centuries clash with new concepts which do not always hold their ground and have not been completely formed. The socialist person is not fenced off from the past, the roots of his consciousness go back into old social conditions. He is not partitioned off from the influence of various present-day forms of bourgeois ideology. The individual of today is drawn, stronger than ever before, into the circuit of events."

O. Rossiyanov also reflects upon these questions when he analyses one of the best works of Hungarian socialist literature, the novel *Részeg eső* (Heady Rain) by József Darvas. In his article Yu. Gusev talks about the complicated questions which sometimes face young people in the socialist countries and which appear in literature. In particular, he examines the tale *Füstben eś fényben* (In the Smoke and in the Fire) by the Rumanian writer Ferenc Papp, where the problem of the succession of generations, and of upbringing the new man is resolved in a positive manner.

Moral problems, including the conflict with the vestiges of the old world are acquiring ever greater significance in the prose of the socialist countries; they have become an important sphere in which the ideological message and Party spirit of literature manifest themselves.

In his article on what would seem to be partial question, "The Theme of Personal Responsibility in the Slovak Prose on the Second World War", S. Belza, comparing many

works written in different countries, including the USSR, comes to a convincing generalisation: "At the present stage, the literature of the socialist countries is striving to show all the diverse influences and impulses which determine people's thoughts and deeds, without simplifying them in the least, without avoiding the exceptional cases of choice, for they also assist in comprehending typical regularities."

In the book the idea is set forth that socialist realism which examines the individual in the dynamics of historical, social development, is able to show man in all his complexity, in all the different shades of his consciousness and mentality, and has already gained quite a lot of experience in this sphere. It is just this sense of historical perspective that can help the writer reveal man's inner life in all its wealth and integrity, which withstands any decline and anarcho-individualistic disconnection.

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BIBLIOGRAPHY

REVIEWS OF FOREIGN BOOKS IN SOVIET SERIALS

History. Auxiliary Historical Disciplines

Великият прелом. Петдесет години от Септемврийското антифашистско въстание 1923 година. (Материали от юбилейната научна сесия в Михайловград, 13 и 14 семптември 1973 г.). София, 1974, 286 с.

Рец.: Чернявский Г. *Новые книги...* № 8, стр. 63-68.

Трайков В. *Георги Стойков Раковски.* Биография. София, 1974, 408 с.

Рец.: Сидельников С. *Новые книги...* № 9, стр. 48-54.

Amand de Mendieta E. *Mount Athos.* Berlin-Amsterdam, 1972.

Рец.: Гудушаури Г. *Известия АН Грузинской ССР. Серия языка и литературы.* Тбилиси. № 1, стр. 151-155. На груз. яз.

Angles Vargas V. *Machupijchu, enigmática ciudad inka.* Lima, 1972, 434 p.

Рец.: Башилов В., Серов С. *Советская этнография.* № 4, стр. 184-187.

Angles Vargas V. *P'isaq. Metrópoli Inka.* Lima, 1970, 168 p.

Рец.: Башилов В., Серов С. *Советская этнография.* № 4, стр. 184-187.

Burn A. R. *The Romans in Britain. An Anthology of Inscriptions.* Oxford, 1969.

Рец.: Садовская М. *Вестник древней истории.* № 3, стр. 204-206.

Collingwood R. G., Wright R. P. *The Roman Inscriptions of Britain.* V. I. Oxford, 1965.

Рец.: Садовская М. *Вестник древней истории.* № 3, стр. 204-206.

Soviet serials appeared in 1975 in Moscow (unless stated otherwise).
Abbreviations:

Рец.— book review
В сб.— in the collection
В кн.— in the book
Вестник МГУ — *Вестник Московского университета;*
Мировая экономика... — *Мировая экономика и международные отношения;*
Научные доклады... — *Научные доклады высшей школы;*
Новые книги... — *Новые книги за рубежом по общественным наукам;*
США... — *США — экономика, политика, идеология.*

Crowley J. *This Sheba, Self. The Conceptualisation of Economic Life in Eighteenth Century America.* Baltimore, 1974, 161 pp.

Рец.: Гаджиев К. *Новые книги...* № 9, стр. 42-47.

Delperrié De Bayac J. *Histoire du Front populaire.* Paris, 1972, 542 p.

Рец.: Кравченко Е. *Вопросы истории.* № 9, стр. 191-193.

Dworkin E. *Od Manzanares do Oki. Wspomnienia dąbrowszczaka.* Warszawa, 1974, 117 s.

Рец.: Перцигер И. *Новая и новейшая история.* № 5, стр. 194-195.

Gaunt D. *Utbildning till statens tjänst. En kollektiv biografi av stormaktstidens hovrättsauskultanter.* Uppsala, 1975, 219 s.

Рец.: Кан А. *Новые книги...* № 8 стр. 76-80.

Gecse G. *Vallástörténeti kislexikon.* Budapest, 1971.

Рец.: Балаж Д. *Вопросы философии.* № 9, стр. 158-159.

Longo L. *I Centri dirigenti del PCI nella Resistenza.* Roma, 1973, 515 p.

Рец.: Гайдук В. *Новая и новейшая история.* № 4, стр. 200-201.

Lukacs J. *Istenek utjai. Második kiadás.* Budapest, 1973.

Рец.: *Вопросы философии.* № 9, стр. 161.

Macaulay N. *The Prestes Column. Revolution in Brazil.* New York, 1974, 281 pp.

Рец.: Хенкин С. *Новая и новейшая история.* № 4, стр. 217-219.

McInerny M. *Peadar O'Donnell. Irish Social Rebel.* Dublin, 1974, 254 pp.

Рец.: Крылов Л. *Новые книги...* № 9, стр. 64-69.

Menger M. *Die Finnlandpolitik des deutschen Imperialismus, 1917-1918.* Berlin, 1974, 242 S.

Рец.: Холодковский В. *Новая и новейшая история.* № 5, стр. 208-210.

Pomper Ph. *Peter Lavrov and the Russian Revolutionary Movement.* Chicago, 1972, 256 pp.

Рец.: Новиков В. *Вопросы истории.* № 9, стр. 189-191.

Resistance. Erinnerungen deutscher Antifaschisten. Berlin-Frankfurt a/M., 1973, 477 S.

Рец.: Кудрявцева Н. *Новая и новейшая история.* № 5, стр. 192-193.

Ruge W. *Hindenburg. Porträt eines Militaristen.* Berlin, 1974, 573 S.

Рец.: Гинцберг Л., Драбкин Я. *Новая и новейшая история.* № 5, стр. 205-208.

Smiałowski J. *Zarobkowanie pozarolnicze ludności rolniczej w Królestwie Polskim w latach przeduwłaszczeniowych (1815-1864).* Łódz, 1973.

Рец.: Станкевич Е. *Советское славяноведение.* № 5, стр. 81-83.

Stenbock-Fermor A. *Der rote Graf. Autobiographie.* Berlin, 1973, 511 S.

Рец.: Ерин М. *Новая и новейшая история.* № 4, стр. 203-205.

Terray E. *Le marxisme devant les societés "primitives".* Paris, 1969.

Рец.: Семенов Ю. *Советская этнография.* № 4, стр. 154-163.

Tych F. *Związek robotników polskich 1889-1892. Anatomia wczesnej organizacji robotniczej.* Warszawa, 1974, 506 s.

Рец.: Орехов А. *Вопросы истории.* № 8, стр. 195-197.

What is the Good of History? Selected Letters of Carl L. Becker, 1900-1945. Ed. by M. Kammen, Ithaca-London, 1973, 372 pp.

Рец.: Гаджиев К. *Вопросы истории.* № 8, стр. 198-200.

Problems of Today. International Relations

Димитров Д. *Социалистическият интернационал и европейската сигурност.* 1951-1972 гг. София, 1975, 202 с.

Рец.: Храмцов А. *Новые книги...* № 9, стр. 54-59.

Румыния в годы народно-демократической революции. 1944-1947. Сокр. пер. с рум. М., 1974, 344 с.

Рец.: Язькова А. *Новая и новейшая история.* № 5, стр. 186-188.

Цеденбал Ю. *Избранные статьи и речи. 1962-1973 гг.* Пер. с монг. М., 1974, 560 с.

Рец.: Таксубаев А. *Вопросы истории КПСС.* № 8, стр. 126-130.

Aussenpolitik der DDR — für Sozialismus und Frieden. Berlin, 1974, 302 S.

Рец.: Козликин В. *Новая и новейшая история.* № 4, стр. 198-199.

Bak A. *Hrdi v boji i v mierovej práci.* Bratislava, 1974, 248 s.

Рец.: Подколзин В. *Новые книги...* № 8, стр. 58-62.

Bloomfield L. P. *In Search of American Foreign Policy. The Humane Use of Power.* New York etc., 1974, 182 pp.

Рец.: 1. Подлесный П. *Международная жизнь.* № 10, стр. 132-134; 2. Гусева В. *США...* № 10, стр. 93-95.

Clemens W. C., Jr. *The Superpowers and Arms Control. From Cold War to Interdependence.* Lexington (Mass.), 1973, XXVI, 180 pp.

Рец.: Чернов В. *Международная жизнь.* № 9, стр. 138-139.

Collins J. M. *Grand Strategy. Principles and Practices.* Annapolis (Maryland), 1973, XXV, 338 pp.

Рец.: Святов Г. *США...* № 8, стр. 96-100.

Corson W. R. *Consequences of Failure.* New York, 1974, 215 pp.

Рец.: Романов И. *Международная жизнь.* № 8, стр. 134-136.

DDR. Werden und Wachsen. Zur Geschichte der Deutschen Demokratischen Republik. Berlin, 1974, 576 S.

Рец.: Гоньшорек Г. *Новая и новейшая история.* № 5, стр. 184-185.

Elm L. *Der "neue" Konservatismus. Zur Ideologie und Politik einer reaktionären Strömung in der BRD.* Berlin, 1974, 122 S.

Рец.: Новик Ф. *Мировая экономика...* № 9, стр. 139-140.

Elson R. T. *Time Inc. The Intimate History of a Publishing Enterprise.* V. 1-2, 1968-1973. V. 1. 1923-1941. 505 pp. V. 2. 1941-1960. 504 pp.

Рец.: Бурмистенко А. *Вестник МГУ. Журналистика.* № 3, стр. 76-78.

Engelhardt K., Heise K.-H. *Militär-Industrie-Komplex im staatsmonopolistischen Herrschaftssystem.* Berlin, 1974, 304 S.

Рец.: Ширинян П. *Новые книги...* № 9, стр. 32-37.

Fencsik L. *A mai trockistak.* Budapest, 1974, 288 o.

Рец.: Хевеши М. *Рабочий класс и современный мир.* № 4, стр. 172-175.

Ferreira E. *Le colonialisme portugais en Afrique: la fin d'une ère.* Paris, 1974, 176 p.

Рец.: Анхов А. *Новые книги....* № 9, стр. 70-74.

Fidder E. *NATO: The Dynamic of Alliance in the Postwar World.* New York, 1973, IX, 153 pp.
Рец.: Максимов А. *Мировая экономика...* № 10, стр. 134-135.

Gaida E. *Polska polityka zagraniczna. 1944-1974. Podstawowe problemy.* Warszawa, 1974, 353 s.
Рец.: Иванов А. *Международная жизнь.* № 9, стр. 132-134.

Gambke H., Jakob K., Mätzig K. *Sultanspaläste in Volkes Hand. (Die Volksdemokratische Republik Jemen).* Berlin, 1974, 168 S.
Рец.: Гусаров В. *Новые книги...* № 8, стр. 72-76.

Gurtov M. *The United States Against the Third World. Antinationalism and Intervention.* New York, 1974, 260 pp.
Рец.: Аркадьев Н. *Международная жизнь.* № 10, стр. 140-141.

Hallstein W. *Die Europäische Gemeinschaft.* Düsseldorf-Wien, 1974, 421 S.
Рец.: Зарицкий Б. *Мировая экономика...* № 8, стр. 139-140.

Hess S. *The Presidential Campaign: the Leadership Selection Process after Watergate.* 1974, 121 pp.
Рец.: Иванян Э. *США...* № 9, стр. 73-78.

Howes Beas C. *Fundamentos ideológicos de la revolución peruana.* Lima, 1973, 144 p.
Рец.: Кузнецов А. *Латинская Америка.* № 5, стр. 219-221.

Kleiner B. *Revolución científico-técnica y liberación.* Buenos Aires, 1973, 200 p.
Рец.: Беляев В. *Латинская Америка.* № 5, стр. 222-223.

Makai G. *Olaj es fegyver az Arab-öbölben.* Budapest, 1975, 222 p.
Рец.: Пряхин В. *Новые книги...* № 9, стр. 14-18.

Nadra E. *Un año de gobierno peronista.* Buenos Aires, 1974, 225 p.
Рец.: Левченко Л. *Международная жизнь.* № 8, стр. 131-133.

"North/Nord". A Special Issue on the Soviet North. Un número special sur le Nord Soviétique. Ottawa, March/April 1973. Mars/Avril 1973. 48 pp.
Рец.: Вдовин И. *Советская этнография.* № 4, стр. 173-175.

Perspectives on Latin America. Ed. by S. L. Baily, R. T. Hyman, New York, 1974, XIX, 105 pp.
Рец.: Людоговская И. *США...* № 9, стр. 81-82.

Polomka P. *Indonesia's Future and South-East Asia.* London, 1974, 40 pp.
Рец.: Кутовая Е. *Азия и Африка сегодня.* № 8, стр. 55.

The Problem of Chemical and Biological Warfare. A Study of the Historical, Technical, Military, Legal and Political Aspects of CBW, and Possible Disarmament Measures V. II. *CB Weapons Today.* Stockholm, 1973, 420 pp.
Рец.: Фролов В. *Мировая экономика...* № 8, стр. 137-138.

Remaking Asia. Essays on the American Uses of Power. Ed. by M. Selden. New York, 1974, 381 pp.
Рец.: Валентинов Б. *Проблемы Дальнего Востока.* № 3, стр. 206-209.

Salan R. *Mémoirs. Fin d'un empire. L'Algerie, de Gaulle et moi.* Paris, 1974, 380 p.
Рец.: Антюхина-Московченко В. *Новые книги...* № 9, стр. 75-80.

Schuster F. *Sozialpartnerschaft oder Klassenkampf?* Frankfurt a/M., 1974, 154 S.
Рец.: Кисляков В. *Новые книги...* № 9, стр. 59-64.

Simai M. *Az Egyesült Államok a 200. évforduló elött.* Budapest. 1974, 368 o.
Рец.: Пряхин В. *Новые книги...* № 8, стр. 68-72.

Small Powers in Alignment. Leuven, 1974, 424 pp.
Рец.: Антонов А. *Международная жизнь.* № 9, стр. 134-136.

Summary of the Hearings before the Group of Eminent Persons to Study the Impact of Multinational Corporations on the Development and on International Relations. New York, 1974, 455 pp.
Рец.: Дыховичная М. *Новые книги...* № 9, стр. 22-26.

Swanberg W. A. *Luce and His Empire.* New York, 1972, 529 pp.
Рец.: Бурмистенко А. *Вестник МГУ. Журналистика.* № 3, стр. 76-78.

Varese S. *The Forest Indians in the Present Political Situation of Peru.* Copenhagen, 1972, 28 pp
Рец.: Березкин Ю. *Советская этнография.* № 4, стр. 182-184.

Williams G. L., Williams A. L. *Crisis in European Defence. The Next Ten Years.* London, 1974, XVII, 334 pp.
Рец.: Белащенко Т. *Международная жизнь.* № 8, стр. 136-138.

Zeitschrift für Geschichtswissenschaft. Berlin, 1971-1974.
Рец.: Беднарек Х. *Новая и новейшая история.* № 4, стр. 182-190.

Ethnography. Archaeology

Burlasová S., Filová B., Kovačevičová S., Michálek I, Šolc J. *Slovenské národné povstanie v lúdovej tvorbe.* Kolektivnu prácu pripravil Národopisný Ústav Slovenskej akadémie vied. Zostavovatel B. Filová. Bratislava, 1974, 256 s.
Рец.: Гусев В. *Советская этнография.* № 4, стр. 176-177.

Mitteilungen des Deutschen Archäologischen Instituts. Römische Abteilung. Band 79, 1972 (I).
Рец.: Пичикян И. *Советская археология.* № 3, стр. 248-256.

Neumann S. *Eine Meklenburgische Märchenfrau.* Berlin, 1974, 223 S.
Рец.: Померанцева Э. *Советская этнография.* № 5, стр. 171-172.

Physical Anthropology and its Extending Horizons. S. S. Sarkar Momorial Volume. Ed. by A. Basu, A. K. Ghosh, S. K. Biswas, R. Ghosh, Bombay etc. 1973, XI, 234 pp.
Рец.: Козинцев А. *Советская этнография.* № 4, стр. 165-166.

Woodall J. N. *An Introduction to Modern Archeology.* Cambridge (Mass), 1972, 96 pp.
Рец.: Клейн Л. *Советская археология.* № 3, стр. 267-273.

Philosophy

Вичев В. *Морал и социална психика.* София, 1974, 384 с.
Рец.: Ганжин В., Мереминский Г. *Вопросы философии.* № 8, стр. 168-169.

Марков М. *Субектът на социалното управление.* София, 1974, 261 с.
Рец.: Савранский И. *Новые книги...* № 8, стр. 33-38.

Художествената култура и развитото социалистическо общество. София, 1974.

Рец.: Северная О. *Советское славяноведение.* № 5, стр. 84-86.

Agh A. *A marxizmus szülohelye és titka.* Budapest, 1974.
Рец.: *Вопросы философии.* № 9, стр. 160.

Albrecht E., Asser G., Ebeling W., Fischer W. Köhler K.-H. Völz H., Vogel H. *Streitbarer Materialismus und gegenwärtige Naturwissenschaft.* Berlin, 1974, 174 S.
Рец.: Шушурин С. *Вопросы философии.* № 7, стр. 179-180.

Ancsel É. *A megrendült öntudat mitoszai.* Budapest, 1974.
Рец.: *Вопросы философии.* № 9, стр. 160.

Esztétikai kislexikon. Második, átdolgozott, bövitett kiadás. Szerkesztette: Szerdahelyi I., Zoltai D. Budapest, 1972.
Рец.: Надь М. *Вопросы философии.* № 9, стр. 159.

Fukász G. *Technikai haladás — áldás és áto?* Budapest, 1973.
Рец.: *Вопросы философии.* № 9, стр. 160.

Király I. *Hazafiság és forradalmiság.* Budapest, 1974.
Рец.: *Вопросы философии.* № 9, стр. 160.

Klaus G. *Kybernetik — eine neue Universalphilosophie der Gesellschaft?* Berlin, 1973, 99 S.
Рец.: Пушкин В. *Вопросы философии.* № 7, стр. 180-181.

Köpeczi B. *Az "uj baloldal" ideológiája.* Budapest, 1974.
Рец.: *Вопросы философии.* № 9, стр. 161.

Lendvai L. F., Nyiri J. K. *A Védáktól Wittgensteinig.* Budapest, 1974.
Рец.: *Вопросы философии.* № 9, стр. 161.

Lobsack Th. *Versuch und Irrtum. Der Mensch: Fehlschlag der Natur.* München, 1974, 320 S.
Рец.: Сивоконь П., Вольфсон Э. *Новые книги...* № 9, стр. 37-42.

Marton I. *Eszmék és tévesmék a harmadik világban.* Budapest, 1969.
Рец.: *Вопросы философии.* № 9, стр. 161.

Obzina J. *Ke kritice filosofických a politických aspectů "humanitni demokracie".* Praha, 1974, 112 s.
Рец.: Карпов Г. *Новые книги...* № 8, стр. 39-42.

The Structure of Scientific Theories. Ed. by F. Suppe. Urbana, 1974, 682 pp.
Рец.: Левин А. *Вопросы философии.* № 7, стр. 181-182.

Tökei F. *A szocializmus dialektikájához.* Budapest, 1974.
Рец.: *Вопросы философии.* № 9, стр. 161-162.

Sociology

Berry A. *The Next Ten Thousand Years. A Vision of Man's Future in the Universe.* New York, 1974, 250 pp.
Рец.: Дыховичная М. *Новые книги...* № 8, стр. 54-57.

Beyer W. *Von Sinn oder Unsinn einer "Neuformulierung" des historischen Materialismus.* Berlin, 1974, 95 S.
Рец.: Фурманов Ю. *Новые книги...* № 8, стр. 48-54.

Czajka S. *Społeczno-wichowawcze problemy socjalistycznego zakładu pracy.* Warszawa, 1974, 404 s.
Рец.: Ракаускас Ю. *Новые книги...* № 9, стр. 29-32.

Hahn E. *Theoretische Probleme der marxistischen Soziologie.* Köln, 1974, 348 S.
Рец.: Петров И. *Новые книги...* № 8, стр. 42-48.

Kulczár K. *A társadalom és a szociológia.* Budapest, 1972.
Рец.: *Вопросы философии.* № 9, стр. 161.

Psychology

Прибрам К. *Языки мозга.* Пер. с англ. М., 1975.
Рец.: Лурия А. *Книжное обозрение.* № 42, стр. 7.

Gazzaniga M. *Foundations of Psychology. An Introduction.* New York, 1973.
Рец.: Лурия А. *Вопросы психологии.* № 4, стр. 172-176.

Law

Pleńska D. *Zagadnienia recydywy w prawie karnym.* Warszawa, 1974, 248 s.
Рец.: Гельфер М. *Советское государство и право.* № 8, стр. 150-152.

Ratchnevsky P. *Un code des Yuan.* T. 2. Paris, 1972, XI, 197 p.
Рец.: Мункуев А. *Народы Азии и Африки.* № 4, стр. 220-222.

Starościak E. *Administracja. Zagadnienia teorii i praktyki.* Warszawa, 1974, 340 s.
Рец.: Венгеров А., Лунев А., Пертцик В. *Советское государство и право.* № 8, стр. 149-150.

Staszków M. *Zarys prawa wynalazczego.* Warszawa, 1974, 299 s.
Рец.: Матвеев Г. *Новые книги...* № 8, стр. 9-13.

Waltos S. *Postępowania szczególne u procesie karnym.* Warszawa, 1973, 360 s.
Рец.: Мотовиловкер Я. *Советское государство и право.* № 8, стр. 152-153.

Economics

Икономическата политика на Българската комунистическата партия. Ред. Ж. Аройо. София, 1974, 388 с.
Рец.: Карцев В. *Новые книги...* № 9, стр. 9-14.

30 години икономика на НР България. София, 1974, 560 с.
Рец.: Карцев В. *Новые книги...* № 8, стр. 3-9.

Трудовые ресурсы и научно-техническая революция. (Использование трудовых ресурсов стран СЭВ в условиях научно-технической революции и совершенствования методов социалистического хозяйствования). Под ред. Б. И. Микульского. Совместное издание. Москва-Берлин, 1974, 246 с.
Рец.: Рябушкин Т. *Мировая экономика...* № 10, стр. 131-132.

Цена и качество. (Некоторые вопросы ценообразования и практики установления цен в капиталистических странах). Пер. с англ. М., 1974, 353 с.
Рец.: Герасев В., Шейман И. *Мировая экономика...* № 10, стр. 137-140.

Ценообразование на капиталистическом рынке. Пер. с англ. М., 1975, 312 с.
Рец.: Герасев В., Шейман И. *Мировая экономика...* № 10, стр. 137-140.

Abraham N. *Big Business and Government. The New Disorder.* London, 1974, XVI, 334 pp.

Рец.: Зеленев С. *Международная жизнь.* № 10, стр. 138-140.

Barlay St. *The Secrets Business.* New York, 1974, VIII, 334 pp.
Рец.: Поелуев А. *Мировая экономика...* № 10, стр. 142-143.

Boratav K. *Türkiyede devletçilik.* Istanbul, 1974, 381 s.
Рец.: Моисеев П., Старченков Г. *Новые книги...* № 8, стр. 25-32.

Brook M. Z., Remmers H. L. *The Strategy of Multinational Enterprise. Organization and Finance.* New York, 1970, 389 pp.
Рец.: Сысоев И. *Мировая экономика...* № 8, стр. 133-137.

Crisis in Urban Housing. Ed. by G. McClellan. New York, 1974, 243 pp.
Рец.: Романова Г. *Новые книги...* № 9, стр. 26-28.

The Diffusion of New Industrial Processes. An International Study. Ed. by L. Nabseth, G. F. Ray. Cambridge, 1974, XVII, 324 pp.
Рец.: Протопопов А. *Мировая экономика...* № 10, стр. 141-142.

Dobosiewicz Z. *Ugrupowania integracyjne krajow rozwijajacychsie. (Amerika Łacińska, Azja, Afryka).* Warszawa, 1974, 230 s.
Рец.: Лопухова Н. *Латинская Америка.* № 5, стр. 214-217.

Facchini E., Pancera C. *Dipendenza economica e sviluppo capitalistico in Israele. Analisi della struttura dello stato sionista.* Milano, 1973, 318 p.
Рец.: Валентинов В. *Мировая экономика...* № 8, стр. 140-141.

Feinstein J. M. T. *Fifty Years of U.S.-Soviet Trade.* New York, 1974, 256 pp.
Рец.: Сутулин А. *США...* № 10, стр. 90-93.

Feldstein M. S. *Lowering the Permanent Rate of Unemployment. A Study Prepared for the Use of the Joint Economic Committee. Congress of the United States.* 18. IX. 1973. Washington, 1973, V, 101 pp.
Рец.: Васильев В. *Мировая экономика...* № 10, стр. 135-137.

Energy: Today's Choices, Tomorrow's Opportunities. Ed. by A. B. Schmalz. Washington, 1974, 301 pp.
Рец.: Алексеев В. *США...* № 10, стр. 99-100.

Jirges M. *Fungovanie socialistickeho trhu v planovanej ekonomike.* Bratislava, 1974, 288 s.
Рец.: Колмаков Г., Торма Ш. *Новые книги...* № 9, стр. 3-8.

Kitzinger U. *Diplomacy and Persuasion. How Britain Joined the Common Market.* London, 1973, 432 pp.
Рец.: Лебедев А. *Новая и новейшая история.* № 4, стр. 215-217.

Levison A. *The Working-Class Majority.* New York, 1974, 319 pp.
Рец.: Алексеев В. *Новые книги...* № 8, стр. 14-19.

McCarthy G. *The Great Big Australian Takeover Book.* Melbourne-Sydney, 1973, 249 pp.
Рец.: Русланов Н. *Мировая экономика...* № 9, стр. 140-142.

The Measurement of Economic and Social Performance. Ed. by M. Moss. New York, 1973, 605 pp.
Рец.: Клинов В. *США...* № 8, стр. 100-102.

Park Y. *The Euro-Bond Market. Function and Structure.* New York etc. 1974, 177 pp.
Рец.: Мусатов В. *Новые книги...* № 8, стр. 19-25.

Robbins S. M., Stobaugh R. B. *Money in the Multinational Enterprise. A Study of Financial Policy.* London, 1974, 231 pp.
Рец.: Сысоев И. *Мировая экономика...* № 8, стр. 133-137.

Wattenberg B. J. *The Real America. A Surprising Examination of the State of the Union.* New York, 1974, 367 pp.
Рец.: Мойкин Н. *США...* № 10, стр. 98-99.

World Economy in Crisis. New Delhi, 1975, 98, 35 pp.
Рец.: Доронина Н. *Новые книги...* № 9, стр. 18-22.

Philology

Вейман Р. *«Новая критика» и развитие буржуазного литературоведения. История и критика новейших методов интерпретации.* Пер. с нем. М., 1965, 428 с.
Рец.: Мендельсон М. *Вопросы литературы.* № 9, стр. 289-291.

Велчев В. *Българо-руски литературни взаимоотношения през XIX-XX в. от Фонвизин до Горки.* София, 1974, 562 с.
Рец.: Григорьев А. *Известия АН СССР. Серия литературы и языка.* т. 34, № 4, стр. 375-376.

Autour d'Alexandre Herzen. Documents inédits publiés par M. Vuilleumier, M. Aucouturier, S. Stelling-Michaud et M. Cadot. Genève, 1973, 349 p.
Рец.: Заборов П. *Русская литература.* Л., № 3, стр. 240-242.

Brüning E. *Das Amerikanische Drama der Dreissigen Jahren.* Berlin, 1966.
Рец.: Мендельсон М. Вопросы литературы. № 9, стр. 286-289.

Brüning E. *Amerikanische Literatur.* Leipzig, 1967, 203 S.
Рец.: Мендельсон М. *Вопросы литературы.* № 9, стр. 280-282.

Burger H., Jaksche H. *Idiomatik des Deutschen.* Tübingen, 1973, 117 S.
Рец.: Чернышева И. *Научные доклады... Филологические науки.* № 5, стр. 105-107.

Berréll K. R. F. *The Quatrains of Nesimi Fourteenth-Century Turkic Hurufi.* The Hague-Paris, 1972.
Рец.: Асланов В. *Советская тюркология* № 3, стр. 99-105.

Hostinský O. *Studie a kritiky.* Praha, 1974.
Рец.: Соловьева А. *Советское славяноведение.* № 5, стр. 83-84.

Herzen A. *Lettres inédites á sa fillé Olga.* Introduction et notes par A. Zviguilsky. Paris, 1970, 91 p.
Рец.: Заборов П. *Русская литература.* Л., № 3, стр. 240-242.

Imendörffer H. *Die perspektivische Struktur von Gor'kijs Roman "Žizn' Klima Samgina".* Berlin-Wiesbaden, 1973, IX, 176 S. (Osteuropa Institut an der Freien Universität Berlin, Slavistische Veröffentlichungen, Bd. 41).
Рец.: Данилевский Р. *Русская литература.* Л., № 3, стр. 242-245.

Kortlandt F. H. H. *Modelling the Phoneme. New Trends in East European Phonemic Theory.* The Hague-Paris, 1972. 177 pp.
Рец.: Зиндер Л., Касевич В. *Вопросы языкознания.* № 5, стр. 144-147.

Lombard A. *La langue roumaine. Une présentation.* Paris, 1974, 396 p.
Рец.: Будагов Р. *Вопросы языкознания.* № 4, стр. 119-121.

O marxistickú jazykovedu v ČSSR. Zbornik referátov zo seminára 17 mája 1973 v Prahe. Bratislava, 1974, 264 s.

Рец.: Кондрашев Н. *Вопросы языкознания.* № 5, стр. 140-143.

Matteson E. e. a. *Comparative Studies in Amerindian Languages.* The Hague-Paris, 1972, 251 pp.
Рец.: Климов Г. *Вопросы языкознания.* № 4, стр. 121-125.

Medieval Russia's Epics, Chronicles and Tales. Ed., transl. and with an indroduction by S. A. Zenkovsky. Revised and enlarged edition. New York, 1974, 526 pp.
Рец.: Бегунов Ю. *Русская литература.* Л., № 3, стр. 232-235.

Nash R. *Turkish Intonation. An Instrumental Study.* The Hague-Paris, 1973, 190 pp.
Рец.: Абдуазизов А. *Советская тюркология.* № 3, стр. 96-99.

Russian Studies of American Literature. A Bibliography. Chapel Hill, 1969, 218 pp.
Рец.: Мендельсон М. *Вопросы литературы.* № 9, стр. 278-279.

Schönfelder K.-H. Wirzberger K.-H. *Amerikanische Literatur in Überblick.* Leipzig, 1969.
Рец.: Мендельсон М. *Вопросы литературы.* № 9, стр. 282-286.

Solotaroff R. *Down Mailer's Way.* Urbana etc, 1974, X, 289 pp.
Рец.: Галинская И. *США...* № 10, стр. 95-98.

Warder A. K. *Indian Kavya Literature.* V. I. *Literary Criticism.* Delhi etc, 1972, 281 pp.
Рец.: Серебряков И. *Народы Азии и Африки.* № 4, стр. 207-212.

Yuče N. *Gerundien im Turkischen. Eine morphologische und syntaktische Untersuchung.* Mainz, 1973, XV, 88 S.
Рец.: Кононов А. *Советская тюркология.* № 3, стр. 95-96.

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Singapore	Book Associated International Shop 117, Show Center, SINGAPORE 9.
Somalia	Samater's, P. O. Box 936, MOGADISCIO.
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Issued by the "Social Sciences Today" Editorial Board

Printed by Nauka Publishers