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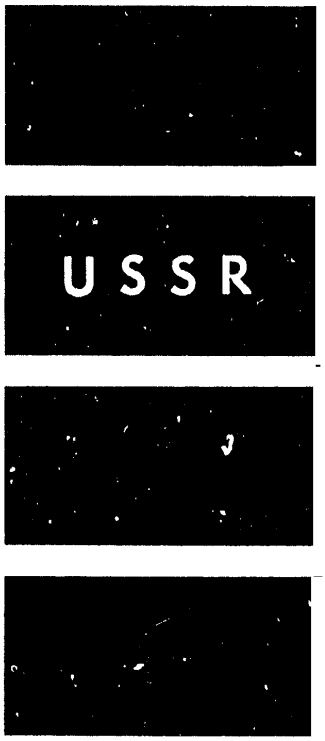

TRANSLATIONS ON USSR SCIENCE AND TECHNOLOGY

BIOMEDICAL AND BEHAVIORAL SCIENCES

(FOUO 13/79)

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NEUROSCIENCES

BRAIN RESEARCH IN GEORGIAN SSR DESCRIBED

Tbilisi ZARYA VOSTOKA in Russian 15 Feb 79 p 2

[Article by Professor T. Oniani, Corresponding Member of the Georgian Academy of Sciences, Director of the Georgian SSR Academy of Sciences Institute of Physiology: "Toward Understanding the Brain"]

[Text] In his report at the 25th CPSU Congress, Comrade L. I. Brezhnev emphasized the importance of fundamental research in scientific problems to resolve priority tasks of the national economy. The role of science in the life of society has risen more than ever these days. In particular, practical medicine under conditions of the scientific-technical revolution cannot get along without the findings of fundamental research in the field of biology. But these findings are valuable in practical health care only if the research is conducted on a high methodological and technical level.

An excellent example of neurophysiological research meeting the needs of practical medicine is a cycle of studies by Academy of Sciences Academician V. Okudzhava on the neurophysiological mechanisms of epilepsy; this work has been nominated for the 1979 Georgian SSR State Prize.

First of all, it should be noted that the Institute of Clinical and Experimental Neurology of the Georgian SSR Ministry of Health, where V. Okudzhava directs the experimental division, has long since become a scientific center of international significance in epileptology. This institute was the first in the USSR to make use of such refined methodological techniques of investigating the properties of normal and pathological brain neurons as the recording of intracellular potentials, the measurement of the physical parameters of the neuron membrane, the use of a mathematical apparatus to study the distribution of electrical fields in the brain during the development of epileptic shifts, and so on. These methods have made it possible to determine significant facts, the analysis of which has made it possible to describe both the development of epileptic changes in the neuron and the mechanisms of cessation of pathological activity.

V. Okudzhava has convincingly demonstrated that in the epileptic changes of the neuron a decisive role is played by shifts in the synaptic apparatus (that is, intercellular contacts) arising in the presence of

strong synchronic stimulation of a group of nerve cells. He has shown that the same mechanisms underlie an epileptic change in the neurons in various foci of pathological activity. These findings have also made it possible to shed new light on the factors causing the spread of epileptic activity.

The research has also determined the mechanisms which condition the transmission of convulsive activity from one hemisphere of the brain to the other. A knowledge of this can have great practical importance for surgical intervention in the treatment of epilepsy.

Also of great theoretical importance is the scientist's research into mechanisms of cessation of epileptic activity. He found, in particular, that certain sections of the brain stem are the source of inhibitive effect on the cortical neurons. These findings are also very promising for the treatment of epileptics.

V. Okudzhava's research is of great interest not only in epileptology but also in explaining other fundamental problems of general brain physiology.

The Georgian researcher's work in the neurophysiological mechanisms of the development and cessastion of epileptic activity of the brain is internationally recognized. His work has been widely published in foreign journals and is quoted in fundamental monographs. Also indicative of the broad recognition of this research was the International Epilepsy Symposium held in Tbilisi in 1978. Outstanding neurophysiologists taking part in the symposium unanimously acknowledged the big role played by the Georgian researcher in resolving urgent tasks of epileptology and shaping today's understanding of its neurophysiological mechanisms.

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PSYCHOLOGY

TASKS OF PSYCHOLOGICAL SCIENCE, 'VOPROSY PSIKHOLOGII' IN CURRENT YEAR

Moscow VOPROSY PSIKHOLOGII in Russian No 1, 1979 pp 3-8

[Editorial]

[Text] Implementing the decisions of the 25th CPSU Congress, the Soviet people honorably completed the tasks of the Tenth Five-Year Plan's 3d year. The economic and defensive power of our motherland increased even more. Its international authority has risen even higher, brotherly friendship with socialist countries has become even closer and more cohesive, and the inseparable unity of the peoples of our multinational country has grown even stronger. The national economic plans have been completed successfully, and surpassed in many cases. Many labor collectives and individuals satisfied additional work pledges in the socialist competition ahead of schedule. Construction of the Baikal-Amur Rail Trunkline proceeded at full steam. Many new huge production facilities outfitted with the most progressive equipment have been created. A broad program of housing, school, and hospital construction was completed. Many millions of agricultural laborers devoted all of their energy to attaining high yields, and they achieved tremendous successes, exceeding all former indices. The cultural and educational level of the Soviet people climbed even higher, as did the level of our society's social development. The successes of Soviet science and technology are remarkable. Flights by our cosmonauts, including joint flights with the first cosmonauts from fraternal socialist countries, were unprecedented in duration and a number of other indices. Significant successes were also enjoyed in all other areas of scientific knowledge and technical creativity.

Publication of L. I. Brezhnev's noteworthy works "Malaya zemlya" (The Little Land), "Vozrozhdeniye" (Resurrection), and "Tselina" (The Virgin Land) was of exceptional significance. Written by a Leninist communist who had traveled a glorious road of persistent struggle for socialist development in our country and for peace throughout the world, and created by an outstanding official of the international communist and workers movement and the head of the Communist Party of the Soviet Union and the Soviet government, these books are the powerful ideological weapon of the party and all Soviet people.

They embody the best, the truly heroic qualities of the Soviet citizen, his burning love for the motherland and his readiness to sacrifice his own life in its behalf, and they demonstrate the diversity of character seen in Soviet people. The remarkable examples of leadership and control of people, the combination of high exactingness with great benevolence, with a truly humanitarian attitude toward every person deserving of such respect, unbending adherence to principles in evaluation of people, their personal qualities, their acts, and the results of their activities, trust in man, and effective assistance to people experiencing difficult situations, presented in these works, are highly significant. All three of L. I. Brazhnev's works contain rich factual material that is also of great value to psychology.

A deep analysis is given of progress in implementing the decisions of the 25th CPSU Congress, and the major problems of the country's socioeconomic development and improvement of national economic control are posed to the party and people in the substantial and thoroughly grounded speeches by L. I. Brezhnev at the July and November plenums of the CC CPSU, during the 18th Komsomol Congress, and during his trip to Siberia, the Far East, Minsk, and Baku.

The CC CPSU and USSR Council of Ministers decree on schools, published in December 1977, and the All-Union Congress of Teachers held last year had extremely important significance to the country's life and to development of national education.

All of these events, which have been reflected in our journal as well, predetermined the work of Soviet scientists, including psychologists, and they were placed at the basis of the plans for all subsequent research directed at providing immediate assistance to our subsequent development and at providing all-out assistance to national education, child rearing, and the training of the growing generations.

A significant number of works by Soviet psychologists (monographs, collections on particular topics, individual articles) on the pressing psychological problems of the work of public schools, preschool children's institutions, special schools for children suffering specific handicaps, and adult schools, which have such important significance to attainment of universal secondary education for the working youth of our country, were published in 1978. Problems directly associated with directives contained in the decree on schools assumed an especially prominent place. These problems are, first of all, those of improving ideological indoctrination of children and the young, shaping high moral qualities within them, developing independent thinking and the ability to learn, providing vocational training and indoctrination, and providing occupational orientation. Soviet psychologists devoted significant attention to characterizing different forms of activity engaged in by children and young people--at play and in their studies, particularly in regard to the motivations for studying, development of conscious learning

activity, the problems of communication of children among themselves and with adults, development of collectivism, and participation of senior students in socially useful activity and in the development of children's and young people's collectives.

Work in other areas of psychological science was initiated in 1978. Doubtless achievements have been attained in social psychology, both in relation to particular problems and, what is especially important, in relation to the basic theoretical problems; also of importance is comparison of the theoretical positions of Soviet psychologists with the viewpoints of social psychologists in capitalist countries, as well as criticism of their conceptions. Many works have been published on the problems of labor and engineering psychology, which are revealing the features of new forms of labor arising in the course of the scientific-technical revolution, new forms of occupations and the means of preparing people for them and shaping the psychological qualities required by these new occupations. A number of works have been finished in a new area of psychological science--the psychology of the management and control of labor collectives. The psychological problems behind the effectiveness of agitation and propaganda were studied. Research on the psychology of aviation and cosmonautics occupied a special place. Problems of sports psychology, pathopsychology, and neuropsychology were studied. Work done in psychophysiology, particularly in relation to the problems of differential and genetic psychology, represents valuable research. We should note publication of the next volume of the "Osnovy psikhologii" (Fundamentals of Psychology)--"The Biological Fundamentals of Psychology," which contains rich information on the results of research on the material substrate of the mind, and modern data on the work of the brain and nervous system.

Among the problems of general psychology that were studied in the past year, we should point out those of the psychology of activity--its basic concepts, the structure of activity, conscious forecasting of actions, and the role of the unconscious in the activity of people. A number of research projects were completed on the laws governing various mental processes--perception, memory, thinking, imagination--and on emotions and emotionality. Work on the problems of set and some problems of personality qualities was successful.

Nor should we fail to mention, finally, the problems of the history of psychological science (mainly in this country), which are also illuminated, though on a limited scale (mainly in connection with anniversary celebrations), in the works of Soviet psychologists, and correspondingly in some articles published in our journal.

In addition to the broad front of research done by Soviet psychologists in the past year, we should not fail to note the valuable work done to popularize psychological knowledge, particularly to prepare a number of pamphlets published by Izdatel'stvo "Znaniye." We must do everything to encourage such publications acquainting the popular reader with the

achievements of modern psychological science, a knowledge of which is necessary to all forms of human activity, to development of a materialistic philosophy in every Soviet citizen, and especially to education of the growing generations.

Reciprocal communication among Soviet psychologists at a number of conferences and symposiums on various problems of psychological science, particularly on those of the psychology of activity, social psychology, the psychology of learning in the school, and the unconscious, had an important place in the scientific life of Soviet psychologists in 1978. Friendly meetings with psychologists of foreign, primarily socialist countries, both at jointly sponsored symposiums and at scientific forums organized by psychologists of particular countries and attended by their foreign colleagues on invitation, were highly useful. There were quite a few meetings with foreign scientists during the numerous trips abroad by individual Soviet psychologists and during visits by foreign scientists to our country.

The work of our journal was discussed three times in 1978 at different meetings of Soviet psychological scientists. Students of the Institute of Advanced Training of VUZ Instructors in Pedagogics and Psychology under the USSR Academy of Pedagogical Sciences acquainted themselves with its work, and it was discussed at an expanded session of the journal's editorial council and at an expanded session of the office of the USSR Academy of Pedagogical Sciences' psychology department.

The overall assessment given to the journal was positive, but at the same time a number of critical remarks and wishes for the future were expressed as well.

Considering these remarks and wishes as well as its own intentions, in the new year--1979--the journal plans to first of all organize discussion of the pressing problems of psychology at the present level of its development. The most convenient form for such discussion is the "round table," and on suggestion of some of the journal's readers the problem of a psychological service as a direct link between psychological science and practice is to be one of the first subjects discussed.

The broad range of work being done in particular areas of psychology is creating favorable conditions for the work of practical psychologists, inasmuch as the research is revealing a significant number of laws important to the solution of practical problems. Nevertheless there are certain difficulties in introducing these laws into practice, inasmuch as they are relatively abstract in most cases, and this adds a great deal of complexity to their utilization in the concrete living situations with which the practical psychologist must deal, and which require quite definite recommendations from him. Thus it is extremely important to discuss the content of the practical psychologist's work, the methods of his work, the nature of his training for a concrete practical function and, what is especially

important, the problems of providing systematic guidance to his work through a locally organized system of applied (scientific-practical) psychological laboratories, offices, and teaching centers. We must not forget that inadequate preparedness of the practical psychologist for solving practical problems in the concrete working conditions of particular enterprises, training institutions, and medical institutions can easily undermine the very idea of practical psychological services and do harm to the development of psychological science; by assisting in the solution of practical problems, in addition to promoting its own development the latter is considerably benefited by the rich factual material it acquires from practical solution of these problems, generalizing it and revealing new laws highly significant to itself.

Other topics that could be proposed as pressing psychological problems for discussion at the "round table" include interaction of psychologists and pedagogues, the mutual relationships between psychology and physiology, the place of mathematics in psychological research, and the avenues of its utilization. Naturally all these problems must be discussed by psychologists jointly with representatives of these other sciences.

A special place must be given to the systems approach problem in psychology. This approach has already been discussed in a number of works, but we still have not achieved sufficient unity in the very definition of this approach and, most importantly, in its specific application to experimental studies and theoretical generalizations. This problem demands meticulous and thorough discussion.

As far as the range of experimental studies is concerned, what we need here first of all is deeper and more-comprehensive study of the problems toward which psychology has been oriented by the December (1977) CC CPSU and USSR Council of Ministers decree on the schools. What had been done last year by psychologists in this direction is still not at all enough, and what we need is deeper and more systematic study of these problems by psychology, such that the latter's contribution to implementing the decrees of the party and government would be sufficiently substantial. The problems referred to here were noted above; it is about them that the research of psychologists must be centered, of course with the focus placed on those problems within the competency of developmental and pedagogical psychology.

Naturally specialists in these areas are concentrated mostly at the psychology departments of the numerous pedagogical VUZ's and at universities training teachers. But the number of works submitted to the journal from these training institutions is entirely inadequate to the number of colleagues in these departments. To an equal degree, even the scientific level of those relatively few works which do reach the journal from psychologists working at these training institutions is far from always satisfactory. This situation must be decisively changed. Unification of the departments of several VUZ's in relation to some single problem, joint work on a concrete subject pertaining to a particular problem, and a

significant increase in the demands placed on the studies being conducted through their thorough discussion, without fear of highly business-like and thorough criticism aimed at rendering collective assistance to each researcher, could and should play a significant role in this direction.

It is very important for the journal to carry, in addition to research papers intended for the eyes of psychological specialists, works which would be addressed directly to teachers and other practical workers in national education. Such a department does exist in the journal, but there are clearly not enough articles in it, and the articles that are published are not always timely. Meanwhile there is a definite need for acquainting practical workers with the results of studies on problems of importance to them. Publication of such articles should not only help practical workers in their activities but also raise the general level of their training and upgrade their qualifications. The journal's editorial board appeals to our most highly qualified and erudite psychologists to devote all of their attention to the need for their active participation in this department of the journal.

It is extremely important to keep research on problems forewarded by the December (1977) decree on the school from being limited to just the urban schools, as is true today in the overwhelming majority of the cases. The research must also deal with students in rural schools. This also follows directly from the CC CPSU July (1978) Plenum decrees on further development of agriculture and on social development of sovkhozes and kolkhozes.

Similar requirements must be imposed on social psychology as well. In relation to their psychological make-up--needs and interests, level of education and culture, interpersonal mutual relationships--the modern kolkhoz peasantry and today's sovkhoz workers differ fundamentally from their predecessors of 20-25 years ago. The task of psychologists is to study these new traits jointly with sociologists and reveal them in today's rural and sovkhoz laborors.

Naturally we cannot limit the introduction of psychological science into practice just to the area of national education. Research must be significantly expanded on the problems of labor psychology and engineering psychology, management psychology, aerospace psychology, public health, sports and physical culture, criminal psychology, and forensic (legal) psychology. There are many concrete, applied problems in all of these areas (as is true for the area of pedagogical psychology as well), and it is on the basis of these problems that we must organize the psychological service mentioned above. At the same time it is extremely important that all of these studies would provide, to the extent possible, useful information to general psychology itself, and equally so that these areas of psychology would rely upon this material as well.

In this connection we cannot ignore the present situation of general psychology. Intensive development of various special areas in psychological science has brought us to a situation in which the emphasis on the study of general psychology's problems in our country is now less than what would be required by the significance of research in general psychology and by the central, fundamental significance of general psychology. Indicative in this regard is the fact that even in our journal the number of articles in this area decreased considerably in the past year, while in fact this area must be the basis, the backbone of all special areas of psychological science. Meanwhile even the relatively small number of works on general psychology that have been published are dispersed among a large number of the divisions and problems of general psychology and far from always consider important topics significant to other sectors of psychology and to solution of the problems of psychological theory.

The need for research in the history of psychological science should be pointed out as well. The new year--1979--is one of a number of jubilees: It will be the 150th birthday of I. M. Sechenov, the founder of our domestic scientific, materialistic psychology; it will be the 100th anniversary of Wundt's establishment of the world's first psychological laboratory in Leipzig; it will be the 100th birthday of K. N. Kornilov, the first (together with P. P. Blonskiy) to argue for creation of a Marxist psychology and for fundamental reconstruction of psychological science on the basis of Marxism-Leninism; it will be the 90th birthday of S. L. Rubinshteyn, whose work played a prominent role in development of Soviet psychology. All of these dates must be commemorated by works revealing the role of each of these scientists in the development of our science. We must also publish other works on the history of psychology having great importance to resolution of the psychological problems of today.

We have been discussing the content of that which must be done by Soviet psychologists in the present year, and that which must find its reflection in this journal. But in addition to this we must point out another extremely important task concerning not the content but the style of works published in VOPROSY PSIKHOLOGII. In a number of cases they are encumbered by numerous details having no serious, fundamental significance. They contain many special terms, often deliberately coined or not yet in common scientific usage, sometimes known only to a narrow circle of specialists working on some narrow problem; they contain an abundance of formulas expressing something that has already been said with sufficient clarity in words and not providing any new information. All of this goes a long way to decrease the size of the audience that can understand the articles submitted to the editorial board, deprives them of informative value, and elicits valid reproaches from many readers who are interested in the subject of an article but find the content incomprehensible. Consider this in the light of the fact that the journal's purpose is to upgrade the qualifications of its readers, broaden their knowledge, and help them in their scientific growth.

This journal now has a subscription of 19,000. This means that the journal is being read not only by specialists in psychology but also scientists in other areas of science--philosophy, physiology, and pedagogics, as well as by many practical workers requiring, by the nature of their activity, the latest data of psychological science, and by a sufficiently broad range of persons that simply have an interest in psychology. This, of course, causes certain difficulties in preparing articles for the journal, which must be surmounted.

Nor can we fail to mention, finally, the substantial proportion of the articles submitted to the editorial board which simply go on and on without saying much; their excessive wordiness also makes it difficult to get a clear understanding of the content. This problem encouraged the editorial board to demand a brief and clear presentation and shorter articles from authors from now on.

We would like to express out confidence that the journal's readers will heed all of the wishes stated above. The journal's editorial board will be grateful to them for whatever proposals they may possibly have, and especially for their concrete satisfaction of the suggestions stated here in the articles they submit to the editorial board.

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PSYCHOLOGY

INCREASING EFFECTIVENESS OF NATIONAL ECONOMY'S MANAGEMENT, PSYCHOLOGICAL SCIENCE

Moscow VOPROSY PSIKHOLOGII in Russian No 1, 1979 pp 9-16

[Article by M. I. Gvardeytsev]

[Text] Our society's progress depends in many ways on the extent to which we can increase the effectiveness with which the national economy is managed. In his report to the 25th Congress of the Communist Party of the Soviet Union, CC CPSU General Secretary Comrade L. I. Brezhnev emphasized that at the present stage of communist development, "organization--that is, further improvement of the economy's management in the broad sense of the word--is becoming the decisive link."*

Today, most executives and experts feel that the effectiveness of management can be raised by introducing automation resources into this process.

Creation of effective automated control systems is an extremely complex, multifaceted problem. The principal issue within it is that of defining what would be a harmonic combination of technical resources, mathematical resources, and man in the control process.

The following question arises in this connection: What do management agencies and executives need, and what are the objectives of outfitting them? The objectives are sufficiently clear. We must create conditions permitting the executive to verify each of his decisions in terms of its correspondence to the objective laws of social development. The best decision in each concrete case would be the one that corresponds maximally to objective laws. Basing ourselves on this objective, we can determine the resources with which we need to outfit management agencies.

L. I. Brezhnev noted that "upgrading the quality of all work has become the key problem in development of all of our national economy. This pertains

*"Materialy XXV s"yezda KPSS" (Proceedings of the 25th CPSU Congress), Moscow, 1976, p 58.

to the quality of our plans--that is, the grounds upon which they are written and their balance. This pertains also to the quality of managerial activity--from the lowest levels of production administration to the central economic agencies."*

In practical management of the economy, we encounter a tremendous quantity of information describing the current conditions in which the activities of each enterprise proceed; the current status of the enterprise itself; the goals that must be reached. In order that a grounded decision could be made--that is, one corresponding to objective laws, all of this information must be analyzed, evaluated, and comprehended. This work must be carried out currently--that is, in pace with the course of real management processes. Clearly resources supporting rapid information processing must come to the aid of the manager in this case. Were we to ask the question "And what are these resources?", the most likely answer would be "Electronic computers."

But it is fundamentally impossible to improve management quality by just introduction of computers alone. They cannot tell us what rules to follow when processing information to be used as quantitative grounds for decisions; they only possess a universal capability for performing computations on the basis of prescribed algorithms.

Thus we arrive at the conclusion that there is a need for a mechanism which would give substance to the objective laws of social development in the form of the rules of formalized information processing; this mechanism can be stated as mathematical definition of the categories of scientific management of the society. In my monograph published in 1978 by Izdatel'stvo "Sovetskoye radio" I called this mechanism a system of special management software. It must ensure arrival at quantitatively grounded decisions supporting achievement of the goal posed to the enterprise, and implementation of a succession of measures and actions to complete a plan, in pace with the actual tempo of management and depending on the evolved conditions and the situation.

We cannot achieve the goals formulated above without building a system. The correctness of this assertion is implied by the following considerations.

First, the objective laws of social development exist as a mutually associated set. Therefore their influence on management practices could be reflected only on the condition that we build a system of mutually associated rules for information processing and decision making.

Second, the process of gaining an understanding of objective laws is continuous. Therefore the special management software must undergo improvement as

*Brezhnev, L. I., "Voprosy upravleniya ekonomikoy razvitogo sotsialisticheskogo obshchestva. Rechi, doklady, vystupleniya" (Problems in Management of the Economy of Developed Socialist Society. Speeches, Reports, Addresses), Moscow, 1976, p 493.

well. This improvement is possible only on the condition that we accumulate the attained results within the framework of a system.

Third, whether or not we raise the effectiveness of management depends significantly on the extent to which actions are coordinated at all levels and in all units of the management system. We cannot achieve such unity without uniting all formalized information processing rules in a system.

Hence follows the conclusion that accumulation, development, and utilization of formal rules that are a reflection of the objective laws of social development would be possible only within the framework of a system, defined as a system of special management software.

Thus in addition to the fact that the executive must have the necessary education, he must be outfitted with resources with the help of which he could utilize the achievements of science at a pace that keeps up with the real course of managerial processes.

The problem of automating management is a very important one of the relationship between the executive's talent and management science. The notions of some cyberneticists, especially foreign ones, who sometimes fail to see man behind automated control processes, belittling his role in these processes, have recently become fashionable.

The issue concerning the relationship between the creative and formal approaches to management is among the most important. There is an inseparable link between individual responsibility and creativity, since the former cannot exist without the latter. Therefore if the formal methods of our system of special management software constrains the creative capabilities of the executive, these methods are unviable.

Management will always remain deeply creative in complex man-machine systems. Collectives of people are a constant part of such systems, and therefore an attempt to completely formalize management in such systems would be fruitless. The creative element will always be at the basis of the work of control agencies in such systems.

Special management software, which is a set of algorithms, is the formal foundation of information processing. Of course this formal system reflects the objective laws of social development. It is based on generalizations of the creative experiences of people and the scientific theories they have developed. But formalized models are incapable of reflecting the entire diversity of the living process of control. The need arises in this connection for uniting the formalized mechanism of management software with the creative capabilities of executives. This union is harmonically achieved with the help of the sets of algorithms provided by the system of special management software, and it is the principal feature which makes these algorithms different from those of mathematical models that can support only the modeling of processes being controlled.

After we define the goal of our actions we create the plan for achieving this goal. The process of creating the plan can be formalized sufficiently well. The creative element in its development manifests itself as the search for ideas which would help us to achieve this goal with greater effectiveness than we might enjoy by using just formalized methods alone. The variant of the plan developed with the assistance of formalized methods is called the master plan. New variants, which arise under the influence of new ideas, make this master plan more concrete. The person controlling the process evaluates all of the resulting variants and selects, as his decision, that which in his opinion is the best for achieving the assigned goal. The last word in reaching a decision remains with man. Here lies the expression of the creative role of the executive in management utilizing automated resources.

Let us dwell in greater detail on the issue concerning the relationship between technical automatic control resources, including computers, and the special management software system. According to today's interpretation special management software is an attribute of technical automation resources, and not a means of management support. Obviously this viewpoint was correct and even unavoidable at the first steps of introduction of automated resources with the purpose of raising management effectiveness. Today, however, such an idea harbors a number of negative consequences. Were we to believe special management software to be only an inseparable part of computers, we would logically have to assume that it is an auxiliary, secondary element. The conclusion that there is an inseparable relationship between technical automation resources and software leads us unwittingly to incorrect organization of the work of creating the special management software. Moreover it makes it difficult for us to resolve the problem of preserving the special software when the technical base undergoes change.

The special management software is inseparably associated with the very process of control, being its principal inherent part. When we take this approach, special software assumes the interpretation of one of the principal resources intended to upgrade the effectiveness of management.

This viewpoint on special management software permits us to correctly determine its place within the overall automated system. Because special management software plays the main role in the overall system of automatic control resources, the conclusion that special attention should be turned to this general system becomes unavoidable.

The general success in raising the effectiveness of management with the help of automation depends on the success with which we solve the problem of creating the special software.

Mcathematics is quite obviously a tool which can help us raise production effectiveness. Traditional mathematics was employed mainly at the product design stage. It played the role of an implement of production. Its use was limited as a rule to the stages of product planning. After manufacture of the product began, mathematics was not present and was not utilized in obvious form in the process of the product's use.

This can be explained mainly by the fact that utilization of mathematical methods in concrete production processes requires great outlays of time for computations. The computation rate is much lower than the rate at which real processes proceed. The situation changed fundamentally with the appearance of electronic computers. They created the conditions for performing computations at a rate which not only coincided with the speed of many real processes, but also exceeded it.

But in order that these potentials could be utilized in management, we would have to create methods of formal information processing. Only mathematical methods for forecasting the course of real processes, for quantitative evaluation of the variants for achieving an assigned goal, and for selection of sensible controlling influences would permit us to make improvements in management techniques using automation as the basis.

All of these methods must be materialized within the system of special management software. Thus special management software becomes an object of consumption, and consequently it must be a product of production. Its creation must go according to a plan, on an industrial basis, utilizing scientific methods, as is done today in the production of all other forms of industrial products.

V. I. Lenin wrote: "In any socialist revolution, after the proletariat completes the task of gaining power...the fundamental task of creating a social structure higher than that of capitalism, namely increasing labor productivity, assumes priority...."* Under today's conditions the growth rate of labor productivity in the economy's management has fallen significantly behind the rate of its growth in industrial production. Elimination of this inconsistency will depend to a significant extent on the success we enjoy in creating the system of special management software.

In this article I would like to dwell rather briefly on a number of issues which make participation of psychologists in creation of this special management software necessary.

If we are to develop the scientific grounds for generalizing the collective experience of executives in relation to making effective management decisions, we would first have to classify the tasks executives must complete.

Studies examining the structure of strategic or tactical tasks have shown that any task is formally a vector representing three components. Its components are:

The initial state of the environment (1),

*Lenin, V. I., "Poln. sobr. soch." (Complete Collected Works), Vol 36, p 187.

the final state of the environment (2),

the process responsible for transformation of the initial state into the final state--the method of task completion (3).

Hence it follows that if we are to classify the tasks we would have to create the means for revealing their similarities and differences, which in the end boil down to determining the similarities and differences of each of the components listed above.

The third component is specifically human--that is, it is an object of psychological research. Psychologists can participate in the formulation of the objective means for revealing and documenting those methods used by executives to complete their tasks. And after such methods are formulated, we can use objectively documented task completion methods as the basis for building a scientific classification of management tasks, and then for generalizing the experience of management in the form of formalized procedures of purposeful information processing. In other words we would obtain that "product" which we need as a component for development of the theory of special management software.

The management process will always remain deeply creative in complex man-machine systems: The element of creativity will always be the basis of the work of control agencies in such systems. As was noted above, the special software must reflect the objective laws of social development, and it must account for the creative experience of many generations of people. The need arises in this connection for uniting the formalized mechanism of special management software with the creative potentials of executives--in such a way that the creative potentials of the executive would not be constrained. If this requirement is not satisfied, then people would abandon the automated resources in the control system as soon as they encounter a situation in which their creative potentials come into conflict with the formal constraints imposed by the automated resources.

How can we ensure such interaction in the SMOU [special management software]? When we talk about an executive's creativity we are primarily implying that in most cases the executive is not given a ready-made task to complete: He is more likely given a problematic situation which he must resolve. And to do so the executive must transform the problematic situation into a task, the latter being a model of the problematic situation documented in one of the formal languages. Construction of this model--that is, formulation of the task--requires specification and formalization of the goal, that final state in which the system must be placed. In this stage the executive exercises his creativity in formulating the goal precisely.

We lay special emphasis here on the fact that what the executive does is, precisely, formulate the goal, and not sort through ready-made goals and choose some one of them. And while certain resources are available in applied mathematics which allow us to formalize the sorting algorithm, we have no mathematical resources with which to formalize at least some of

the processes occurring in goal formulation (in goal setting). This situation is in many ways the product of the fact that not enough work has been done yet on the psychological problems of goal setting. This research must be stimulated in every way possible, since only with its assistance can we reveal the objective laws of this process which would help experts in applied mathematics and programming to develop the necessary "blocks" of the SMOU, ones which, in interaction with the executive, would significantly help him to complete the creative tasks associated with defining the goals.

The language of communication plays a tremendous role in the interaction of man with automation resources. Naturally man would prefer the natural language to which he is accustomed in his dialogue with automation resources. But modern technical automation resources are still unable to employ natural language. Moreover this situation will not change until psychologists include themselves actively in the research on "artificial intelligence" associated in the most intimate fashion with the problems of modeling the environment and representing the relationships between the different components of such models in natural language.

But even in the event that we intensify such research, the language of communication between man and technical automation resources will continue to be formal in the foreseeable future. This is why it would be desirable for psychologists to also concentrate their efforts on improving formalized languages with the goal of making it easier for man to receive information pertaining to all concrete problems with which he must deal. From the standpoint of the most general considerations we can say that man finds it convenient to use information in alphanumerical form, organized in special tables, to handle some problems, while analytical graphs or pictographic representation of information may be found to be more convenient in relation to other problems. We have an urgent need to begin, on the basis of a scientific classification of management tasks, systematic research aimed at determining the typical relationships between the essence of the tasks and the most adequate methods of information display.

Nor should we fail to dwell on yet another very important aspect of supporting the possibility for man's creative participation in SMOU. This aspect is associated with creation of the conditions permitting the executive to correctly interpret the results of solving problems with special software. Creation of such conditions would depend in many ways on the individual's capabilities for comprehending not only the results themselves but also the solution process: It is very often extremely important to man to understand why a technical device, together with the algorithms and programs built into it, suggests a particular solution. The possibility for comprehending, at least in the most general terms, the set of causes and the sequence of deliberations which led to a particular solution would significantly increase the individual's trust in the obtained result and make him feel more comfortable with the SMOU.

This issue of increasing the executive's psychological confidence in the correctness of the information he receives and in the grounds of the resulting recommendations is extremely important in relation to those management systems in which a delay in decision making harbors irreplaceable losses. This is why, relying on a scientific classification of management tasks, psychologists must initiate research to clarify what stages of decision making are most interesting to the individual in relation to different types of tasks, what is the msot sensible and comprehensible form for presenting these stages to the executive, whether or not this form depends on the type of management task, and so on. Basing themselves on such research, experts in applied mathematics and programming would be able to develop the necessary resources and include them within the structure of the SMOU.

SMOU is an entirely new system in management organization and management itself. Today's typical executive has desks and numerous telephones in his office, and perhaps that is all. When we add the SMOU system we add a console with which the executive can assign work to the automation resources, and a screen on which the answers would be displayed to him. But these are simply the external changes that would occur, rather effective but not at all the most important. What is most important is that the equipment in the office would make it possible for the executive to quantitatively substantiate the variants of decisions he would have to make. The executive will get the possibility for analyzing--effectively and, concurrently, profoundly logically and quantitatively--the course and conditions of processes occurring in objects being controlled. Such analysis entails a tremendous quantity of information which today's executive cannot in fact employ, since he does not have a real possibility for analyzing it. With the new system the executive will achieve a possibility for effectively recreating a picture of the recent past, or even of the most remote events. He will receive the possibility for establishing presence of situations similar to current ones in the past, and to acquaint himself with the details of the decisions made by his predecessors in similar situations; he will be able to model the course the processes would take in response to different decisions.

In order that he could capitalize upon all of the possibilities, the executive must be appropriately trained. In particular he will have to recall (or learn for the first time) many concepts which he had not utilized prior to this--effectiveness criteria, optimum decision, probability, confidence interval, risk, and many others. The best way to surmount the negative psychological factors associated with practical assimilation of these concepts is to retrain executives in special courses. Man is not born with ready-made methods of problem solution: They are shaped within him through training. And if it is our task to facilitate and simplify the SMOU introduction stage to the maximum, we would have to turn attention (the most serious attention) to purposefully teaching the methods of working in the new conditions to the people.

We already have various ways for training and retraining management specialists and executives of the most diverse levels--institutes for advanced training, cycles of lectures given at peoples universities of economic knowledge, special courses attended with or without leave from production, and so on. These existing methods and organizational forms of training have been very beneficial, and today they play an important role in increasing the effectiveness with which computers and the methods of mathematical economics are used in management. But the real "payoff" from all of these methods is still low. The effectiveness of training and retraining must be increased significantly, and specialists in educational psychology must provide real assistance in this regard. What should be the minimum necessary volume of knowledge, abilities, and skills possessed by executives of different profiles and different levels? What is the most sensible sequence for their development? What is the effectiveness of different methods (passive and active) and organizational forms of training? Do they depend on the content of the knowledge being assimilated and on the ages of the students?

Providing a complete answer to these and many other questions directly associated with training cannot be the prerogative of just experts in management science, applied mathematics, economics, and computer technology alone. Any training is an active cognitive process in which changes occur in the mental activities of the students. And this aspect is within the competency of specialists in educational psychology.

The positive results that have been obtained in solution of many of the problems listed above by psychologists in application to preschool children, young schoolchildren, and senior students are universally known. I am referring the work of P. Ya. Gal'perin, V. V. Davydov, A. V. Zaporozhets, N. F. Talyzina, D. B. El'konin, N. N. Podd'yakov, and other specialists. It has now become necessary to broaden the sphere of such research, and conduct it in application to other age groups. And if such research were to be started, we would be able to count on obtaining results which would have a favorable effect on the effectiveness of the executive training and retraining system in the very near future.

The shortness of this article does not permit me to dwell in greater detail on all of the problems, requiring the mandatory participation of psychologists, in all stages of the creation of a special management software (development of the theory, processes, and standards, and introduction, operation, and modification). But in my opinion just the sampling of problems discussed here is enough to show that the psycholgist cannot and should not be an "occasional" consultant in this work: The creation and introduction of the SMOU (as well as development of SMOU theory) are posing questions to psychologists which could be answered only on the basis of serious theoretical and experimental research in different areas of psychological science. And the sooner such research enjoys the development it requires, the clearer its organization and coordination, and the closer psychologists work with

management specialists in organizing and conducting such research, the sooner will we arrive at practical recommendations so urgently needed for improvement of the national economy's management.

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SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

ORDER OF LABOR'S RED BANNER INSTITUTE OF MICROBIOLOGY AND VIROLOGY IMENI D. K. ZABOLOTNYY OF THE ACADEMY OF SCIENCES UKRAINIAN SSR

Moscow MIKROBIOLOGIYA in Russian No 1, 1979 pp 163-173

/Article by V. V. Smirnov/

/Text/ May 31, 1978 was the fiftieth anniversary of the founding of the Institute of Microbiology and Virology imeni D. K. Zabolotnyy of the Academy of Sciences UkrSSR, one of the largest microbiological scientific institutions of the Soviet Union.

Organization of this institute was an important landmark in the development of microbiology in our country. Prior to the Great October Socialist Revolution the Ukraine had sanitary-bacteriological institutes and stations which dealt with sanitary-epidemiological problems, and the production of therapeutic and prophylactic bacterial preparations (vaccines, sera).

After the Great October Socialist Revolution favorable conditions arose for comprehensive development of all branches of microbiology, a situation which was associated with the vigorous development of industry, agriculture, and the accelerating requirements of national public health.

In 1929 due to the initiative of the president of the Academy of Sciences UkrSSR, Academician D. K. Zabolotnyy, an Institute of Microbiology and Epidemiology was established in the system of the AS UkrSSR, an institute which was to become a scientific center developing and uniting theoretical and practical research in areas of general, soil, medical microbiology and epidemiology.

Academician D. K. Zabolotnyy became the first director of the institute (1929-1929). In 1930 the institute was conferred the name of D. K. Zabolotnyy. In 1944 it was retitled the Institute of Microbiology imeni D. K. Zabolotnyy of the AS UkrSSR, and -- in 1963--the Institute of Microbiology and Virology imeni D. K. Zabolotnyy, AS UkrSSR.

In the first years of its existence the institute had two divisions--medical and microbiology--with a staff numbering less than twenty. Soon, however, in connection with the accelerating needs facing microbiological science, the institute organized new divisions and laboratories of microbiological and virological orientation. In the pre-war years, 115 people were already working in the institute (including 48 scientists). Working

at various times in the institute were such great scientists as Academician B. L. Isachenko, Academicians of the AS UkrSSR V. G. Drobot'ko and N. G. Kholodnyy, Corresponding Members of the AS UkrSSR I. Ye. Ruchko, L. I. Rubenchik, S. N. Moskovets and N. M. Pidoplichko, Professor K. I. Bel'tyukova, and others.

Staff personnel of the institute carried out broad research in various sectors of microbiology and virology. In the pre-war and first post-war years, comprehensive efforts were devoted to problems of bacteriophages, the biology of microorganisms and their mutability (Corresponding Member, AS UkrSSR, I. Ye. Ruchko, Acad., AS UkrSSR, V. G. Drobot'ko, G. M. Frenkel, B. I. Kleyn, R. E. Sergiyenko, P. Ye. Vizir', M. L. Nepomnyashchaya, L. Yu. Medvinskaya, and others). The institute has isolated and studied about 40 bacteriophages of pathogenic and saprophytic bacteria, some of them for the first time (pertussis, brucellar). Some of the isolated bacteriophages have been used in medicine (dysenterial, staphylococcal). Study was devoted to phages of lactic acid bacteria and methods were worked out to control phagolysin in the dairy industry.

One of the important achievements of the institute in the pre-war period was the determination in 1937-1938, of the etiology of an unknown disease (UD) of horses which caused mass deaths of the horses. It was shown that the etiological agent is the microscopic fungus Stachybotrys alternans (its toxin). This made it possible to work out measures for control of the disease, titled stachibotriotoxicosis and for its rapid liquidation. Staff members of the institute who had studied this disease and developed control measures, were honored with USSR Orders (V. G. Drobot'ko, P. Ye. Marusenko, B. Ye. Ayzenman, D. G. Kudlay, N. Yu. Kolesnik, P. D. Yatel', N. M. Pidoplichko and B. O. Kagan).

The institute determined the etiological role of a toxin of another microscopic fungus Dendrodochium toxicum (Pidopl. et Bilal) in another unknown disease of horses (Zaporozhe "NZ"), called dendrodochiotoxicosis (N. M. Pidoplichko, V. I. Bilay). During the war years, in association with staff personnel of other institutes, these research workers participated in deciphering the etiology of an equine disease, the so-called septic angina and in working out methods for its control.

The war interrupted the peaceful creative labor of the institute collective. Some of the leading personnel who went off to the front died defending the motherland (Director P. Ye. Marusenko, Secretary of the Party Organiaation N. V. Stadnichenko, B. O. Kagan, P. D. Yatel', V. S. Rozhdestvenskiy). The institute was evacuated to Ufa city, then relocated to Moscow where it carried on work in the therapy and prophylaxis of diseases caused by pathogenic bacteria and fungi. In this period the institute entered the structure of the united Institute of Zoobiology, AS UkrSSR.

A great role in the development of scientific research of the institute after the war was played by Honored Scientist, Academician AS UkrSSR,

V. G. Drobot'ko who headed the institute over an 18 year period (1944-1962).

The basic direction in the scientific activity of the institute became investigations on the topic problem "Physiology and Biochemistry of Microorganisms". Broad studies were developed on antibiotics and other biologically-active substances, microbiological synthesis of proteins, etc. Successfully completed were studies on the creation, and introduction into medical practise, of the therapeutic preparation mikrotsid (Corr.-Memb., AS UkrSSR, N. M. Pidoplichko and Corr.-Memb., AS UkrSSR, V. I. Bilay, 1952), on working out the theoretical bases of microbiological synthesis on petroleum hydrocarbons (Corr.-Memb., AS UkrSSR, Ye. I. Krasnikov, 1971). These works were awarded State Prizes of the USSR. For successful fulfillment of a number of other investigations, many staff members of the institute were honored with governmental awards, they were conferred medals and diplomas of the Exhibition of Achievements of the National Economy, USSR, and of the VPONKh, UkrSSR, and name prizes of the Presidium, AS UkrSSR, and so on.

At the present time the institute is coordinating work on problems of physiology and microbiology of microorganisms in the Ukranian SSR, it is successfully carrying on research on mycology, destruction of materials by microorganisms, on general, soil and industrial microbiology, phytocides, phytopathogenic bacteria, virology of plants and on molecular biology of viruses. In 14 divisions and three non-structured laboratories, 470 people are working, of whom 165 are scientific workers, including 2 corresponding members of the AS UkrSSR, 12 doctors and 132 candidates of science.

Research of the institute is being conducted in three problem areas--physiology and biochemistry of microorganisms, molecular biology and microbiological synthesis of protein and other products from hydrocarbons.

A large unit of the institute, which is working on the topic problem "Physiology and Biochemistry of Microorganisms" is the Division of General and Soil Microbiology, which was created in 1929. Its directors have been A. I. Rakitskaya, M. D. Bogopol'skiy, Corr.-Memb., AS UkrSSR, L. I. Rubenchik, and, since 1968, the division has been led by Ye. I. Andreyuk.

Workers in the division have included such renouned scientists as Academician B. L. Isachenko, Academician, AS USSR, N. G. Kholodnyy, V. T. Smaliy, Kh. G. Zinovyeva and O. I. Bershova.

The first investigations of the division were devoted to the ecology of soil microorganisms (N. G. Kholodnyy) and the physiological features of individual groups of bacteria: nitrifying (V. T. Smaliy), azobacter (Kh. G. Zinov'yeva), bacteria decomposed by urea (L. I. Rubenchik).

In the course of two decades the division carried out research on study of the interactions of soil microorganisms and higher plants. The role was established of soil microflora in supply of plants with phosphorus, trace elements and vitamins of the B group (L. I. Rubenchik, V. T. Smaliy, O. I. Bershova).

Considerable attention of the division has been devoted to investigations on the biological fixation of nitrogen by different groups of microorganisms, to the influence of azobacter on plants, to study of the mechanism of interaction of nodular bacteria with leguminous plants (L. I. Rubenchik, Kh. G. Zinov'yeva, O. I. Bershova). The prepared, active strains of azobacter and nodular bacteria have been used for production of azobacterin and nitragin.

A significant place in the research of the division has been occupied by questions of ecology, physiology and taxonomy of soil actinomycetes (Ye. I. Andreyuk, Ye. V. Vladimirova, S. V. Kogan).

Patterns have been found in the distribution of this group of microorganisms in the soils of the Ukraine, Moldavia, the Crimea and the Caucasus, indicator groups of actinomycetes have been discovered for certain types of soils of the south; study has been made of the capacity of actinomycetes to synthesize active compounds.

Detailed study has been made of oligonitrophil bacteria; diagnostic criteria have been proposed for determination of oligonitrophils; their role in nitrogen balance of the soil has been established (Ye. I. Andreyuk, N. I. Mal'tsev).

In the course of recent years, study has been underway of the ecology, physiology and role in nature of lithotrophic--thionic and sulfate reducing bacteria (Ye. I. Andreyuk, I. A. Kozlova). It was established that thionic bacteria are the cause of appearance of an aggressive medium in the construction of the Kiev metro. The completed studies supported development of biological criteria of potential aggressiveness of the ground earth and of measures to assure permanence of underground construction.

The Division of Antibiotics, in creation of the institute, was titled the Division of Medical Microbiology (chief, academician D. K. Zabolotnyy). After 1930, this division was headed--following its transformation into the Division of Pathogenic Microorganisms--by academician, AS UkrSSR, V. G. Drobot'ko, for 32 years. After 1963, the division has been named the Division of Antibiotics (director, B. Ye. Ayzenman).

At first, division research was directed to study of the biological properties of pathogenic bacteria, their metabolism and mutability, and, subsequently, to search for bacteriophages, chemotherapeutic agents and antibiotics and study of the mechanism of their action.

At the present time, the basic direction of research is the search for new antibiotics produced by bacteria and higher plants. Patterns of antibiotic formation are being investigated in association with the systematics of these organisms. Study has been made of various groups of bacteria, especially wide study has been made of saprophytic species of the genus Pseudomonas. New species of the genus Pseudomonas have been discovered; a series of new antibiotic substances has been isolated. It was shown

that synthesis of a number of antibiotics can serve as a species indicator of certain bacteria. Much of value has been done in the division in the field of investigation of antibiotics from bacteria of the genus Pseudomonas and in search of antibiotics from higher plants. It has been shown that higher plants are an extensive source of production of new useful antibiotics. A series of antibiotic preparations has been obtained. The chemical structure has been established of structures which determine their particular antibiotic activity; polysynthetic antibiotics are being created which possess more effective properties than the original preparations. A stimulating influence has been found, in a series of plant antibiotics, on protective mechanisms of the macroorganism. Some of them have been produced in the institute from higher plants and are being used in practise. Thus, imanin has been used over a 20 year period, novoimanin is widely employed, salvin and arenarin are being introduced and are becoming known to industry. The effectiveness of some antibiotics in horticulture has been established.

At the institute broad development has occurred in research on a very important sector of mycology. This had already started in 1933 when a Laboratory of Mycology was organized (director, Corr.-Memb., AS UkrSSR, N. M. Pidoplichko), and transformed in 1936 into a Division. In 1958, in the facilities of this division, Divisions of Experimental Mycology (director, Corr.-Memb. AS UkrSSR, N. M. Pidoplichko) and of the Physiology of Fungi (director, Corr.-Memb. AS UkrSSR, V. I. Bilay) were created.

Objects of research were, for the most part, fungi of the class Deuteromycetes, and, also, some lower and ascomycetous fungi, studied in pure cultures.

The basic directions were ecologo-taxonomic and physiologo-taxonomic, with study of new objects with important national economic significance: microflora of grain, crude fodders, various types of soils and rizospheres of agricultural plants of the UkrSSR and natural plant associations, insect pests, new kinds of materials, construction and raw materials and other localized fungi. A number of fundamental monographs were issued on this area and a number are being prepared for publication. An important place is occupied by questions of the experimental systematics of deuteromycetes, intraspecies heterogenicity, amplitude of mutability of diagnostic indicators, features of metabolism and fine structure.

Description has been made of a number of new taxons; dominating species have been revealed in soils of different climatic zones. The effect has been established of fungi inhabiting soils, on the germination of seeds and growth of agricultural plants. The mechanism of resistance of dark colored fungi to radiation has been discovered; the protective role of melanin pigment has been established.

Study has been made of thermophilic and thermotolerant fungi of the soils of the UkrSSR, among which have been found active producers of proteolytic, amylolytic enzymes, peroxidases. The biochemical bases of thermophilia of fungi and of their thermostable enzymes has been revealed.

The basic direction in the area of study of the physiology and biochemistry of fungi has been the working out of the physiological bases of regulation of growth, morphogenesis, activity of biosynthesis of physiologically-active metabolites-toxins, enzymes, antibiotics, etc. It has been shown that a physiological change is achieved in the phases of growth, in the level of biosynthetic activity of the mycelium, its growth, change occurs in content of protein, nucleic acids, amino acids, change occurs in the sequentiality of formation of individual metabolites and their components. One of the characteristic examples in this plan might be production of a new species of fungus of Penicillium vitale, working out methods for its directed cultivation intending to produce the therapeutic preparation mikrotsid, to produce a high and stable content of extra-cellular enzymes, glucosooxidase and catalase, which lie at the basis of the technology of their industrial production for the needs of medicine and the food industry.

The institute is one of the leaders in the USSR on taxonomy and physiology of toxin-forming species of fungi, causing alimentary mycotoxicosis of man and agricultural animals, and on systematics and physiology of micromycetes.

In 1932, the institute organized a Division of Technical Microbiology (director, M. L. Nepomnyashchaya), which included two structural laboratories: yeast (director, N. V. Stadnichenko) and anerobic (director, G. M. Frenkel'). In 1945 the division was reorganized into the Division of Microbiology of Fermentation Processes (directors, M. L. Nepomnyashchaya and G. M. Frenkel'). Research was carried out on study of the causative agent of bread and sugar syrup spoilage and on working out recommendations for prevention. Processes of acetone-butyl fermentation were investigated. Work on the study of anerobiosis was carried out.

In 1960, research in industrial microbioloby sharply expanded. In the facilities of the division of the Microbiology of Fermentation Processes a Division of Physiology of Industrial Microorganisms (director, Corr.-Memb., AS UkrSSR, Ye. I. Kvasnikov) was organized. A cycle of fundamental investigations was conducted on the systematics, physiology, biochemistry and ecology of a number of groups of microorganisms, which are potentially useful in the national economy.

To be especially noted is the work on study of microorganisms which use petroleum hydrocarbons, alcohols and other forms of inedible raw materials. In the course of this work, selection and comprehensive study was carried out of active producers of protein substances, a number of group B vitamins and carotenoids, proteolytic enzymes and several other substances. Using methods of mathematical planning of an experiment and the computer, search was made for optimal regimes for growing selected cultures in a continuous process.

Research was carried out on changes in the ultrafine structure of cells and in biosynthetic processes of thermotolerant yeasts and bacteria during their continuous growth. It was shown that their capacity for synthesis of protein substances, vitamins and, especially, lipids, varies regularly as a function of the carbon food source and growth rate.

Fundamental work was done on study of lactic acid bacteria. New methods were sought to study them and a new interpretation of their ecology given. Recommendations were worked out for regulation of the vital activity of lactic acid bacteria in biological preservation of fodder, vegetables, fruits and in the meat industry and, also, in control of them as the causative agents of infection in the fermentation industry. Results of work of the division have been introduced into practise with high economic effect. Important work was completed on study of the taxonomy of myco-, arthro-, brevi- and corynebacteria and nocardia.

Since 1934 the institute has had a functioning Division of Phytopathogenic Bacteria (director, for 33 years, K. I. Bel'tyukova, and, since 1970, R. I. Gvozdyak). The division studies causative agents of bacterial diseases of plants and phages of phytopathogenic bacteria.

Study has been done on bacterial diseases of rubber plants, legumes, cereals, vegetables, cucurbitaceous plants, sugar beets, fodder grasses, fruits and several forest species. Isolation and identification were made of the causative agents of diseases (including new species), control measures for several of them worked out. Antimicrobial preparations were sought and the mechanism of their action on the bacterial cell was studied.

An important place in work of the division was occupied by study of the interrelationships of phytopathogenic bacteria with plants and insects.

The Division of Biochemistry of Microorganisms was created several years before the war (director, B. O. Kagan; after the war, Ye. M. Koldayev). Since 1951 directors were Ye. Ya. Rashb, followed by I. Ya. Zakharova.

Research was begun in the sixties, and is now going on, in the chemical bases of O-antigenic specificity, which is determined by the content and structural specificity of the polysaccharides of the cellular membranes of bacteria. The structure of a specific polysaccharide of one of the serotypes of B. coli was determined; a lipophilic sugar, previously not described, was isolated in enterobacteria and its chemical nature established. Lipopolysaccharides of bacteria, their endotoxins, have a broad spectrum of biological activity and potential for use as stimulators of natural immunity.

Methods were worked out in the division for purification and study of the nature of isoenzyme systems and multicomponent complexes of proteo-, cytolytic and other enzymes.

The institute has carried out important research in the field of genetics and radiation mutagenesis of microorganisms. The research--on bacterial mutability--which has been traditionally going on since the organization of the institute, has been continued in the Division of Mutability of Microorganisms, set up in 1955 (director, P. Ye. Vizir'). This was subsequently reorganized into the Division of Genetics of Microorganisms

(director, B. P. Matselyuk). The division has been conducting systematic research on the most important problems of genetics of actinomycetes. A cyclic chart of the genome of Streptomyces olivaceus has been constructed.

A bidirectional replication of a chromosome has been shown for the first time in actinomycetes and a plasmid DNA has been isolated which determines synthesis of an antibiotic, formation of protuberances on the surface of spores and is an effective reproductive factor, mobilizing unidirectional transfer of a chromosome during conjugation from a point fixed on the genetic chart.

The Division of Radiation Microbiology (director, A. M. Pasechnik) was organized in 1961. Basic direction of research of the division is study of the mutagenic action of ionizing radiation upon bacteria. In cultures of Bacillus and Clostridium genera, comparative study was carried out of the mutagenic action of UV-rays, gamma radiation and fast neutrons of an experimental nuclear reactor and the high efficacy was demonstrated of the latter in the induction of variants with changed enzyme activity. As a result of the action of doses of low intensity and graduated selection, strains of Clostridium perfringens, type A and B were produced, for the first time, by way of experimental selection, which had increased biosynthetic activity with potential for use in production of therapeutic preparations, and, also, strains defective in synthesis of individual enzymes, suitable for study of the paths of their biosynthesis. A strain was obtained of the producer of proteinase of Bacillus mesentericus 316M, and introduced into production of light-sensitive materials for regeneration of films.

In connection with the development in the institute of research in biosynthesis of protein from petroleum hydrocarbons, Divisions of the Technology of Biosynthesis, Chemistry of Raw Material and Processes of Biosynthesis were organized.

The basic direction of the Division of Technology of Biosynthesis (director, V. F. Semenov) is the study of kinetics of growth, physiology and biochemistry of industrially important forms of microorganisms, and, devising microbiological technology to produce protein and other biologically active substances from inedible raw materials. Work has been carried out on study of the kinetics of growth, physiology and biochemistry of yeasts which oxidize various carbon-containing substrates. Study is underway of the physiology of growth of producers of enzymes and other biologically active substances of bacterial origin with the intent to direct the process of biosynthesis of enzymes and to devise technological regimens which assure maximum yield of product. Exquisite solutions have been perfected; engineering-technological calculations and modelling of the apparatus for provision of technological processes of biosynthesis have been carried out.

Research in microbial synthesis of fodder protein has been undertaken in the Division of Chemistry of Raw Material and of Processes of Biosynthesis

(director, V. Ya. Masumyan). The division has studied the chemical composition of microorganisms cultured on n-alkanes.

In 1968 the institute created a Division of Biology of Gas-oxidizing Microorganisms (director, Yu. R. Malashenko). Research in the division has established the presence, in natural areals, of thermotolerant and thermophilic (42-65°) methane-using bacteria. Descriptions have been made of new species and methods devised for their isolation and culture. Principles have been worked out for intragroup classification. Diagnoses have been set up for genera and species and keys for their assay. Absence of an absolute substrate specificity in a methane-oxidizing enzyme has been established. It has been found that methane-oxidizing bacteria actively participate in the carbon cycle of the biosphere.

A new kind of raw material--methanol--has been suggested for biosynthesis of protein-vitamin concentrates; active cultures of yeasts have been selected.

In 1970-1977 the institute had a functioning Division of Natural Anti-Tumor Substances (Corr.-Memb. AS UkrSSR, D. G. Zatula). This division studied the microbiological aspects of oncology. A bac. megaterium H strain was found which has an antigenic relationship to the cancer cell; study was made of the anti-tumor properties of culture liquids of microorganisms and antibiotics of plant origin. The composition of microflora of the gastrointestinal tract of patients with malignant tumors has been examined.

Beginning in 1970 the institute has carried on comprehensive study of the microplasma of plants (director, I. G. Skripal'). A medium was proposed recently to cultivate these microplasma, and a suggestion made for improvement of their systematics which has been supported by the International Subcommittee on Systematics of Microplasma.

DNA-dependent RNA-polymerase has been studied for the first time in microplasma and it was shown that in pathogenic species of them, and also in Agrobacterium tumefaciens bacteria, the RNA-polymerase system, like the eucaryot, is of a multiple type.

Presence in microplasma and Agr. tumefaciens of alpha-amanitive sensitive DNA-dependent RNA-polymerase has direct association with their pathogenic potential and capacity to evoke--in higher organisms--diseases of a malignant character. With due regard for these data, suggestion was made of a model of the mechanism of pathogenicity of mycoplasma (without integration of genetic material) and of Agr. tumefaciens (with integration of genetic material).

Broad research has been conducted in the institute on viruses of plants, animals, yeasts, fungi and bacteria. This began in 1960 when the institute organized a Division of Viruses of Plants (director, Corr.-Membr., AS UkrSSR, S. N. Moskovets.

Detailed study has been devoted to distribution of viral diseases of agricultural plants in the Ukraine. Methods have been devised for diagnosis of the majority of viral diseases, identification of their infectious agents, and study made of the ways they are transmitted and circulated in nature. Recommendations have been developed for control of viral diseases of potato, tobacco, tomatoes, sugar beets, hops, legumes and other cultures.

The Division of Phytopathogenic Viruses (director, A. D. Bobyr') has worked out the general principles for seeking out and selection of virus inhibitors, and paths and methods drawn for their wide use to combat viral diseases of agricultural plants. A considerable number of various substances have been discovered which can inhibit a number of phytopathogenic viruses, including products of metabolism of yeast genera Candida and Saccharomyces--substances of a polysaccharide nature; their physical chemical properties and biological activity have been studied. Research on the nature of genetically-determined virus-resistant plants has been carried on.

Methods have been devised for cultivation, isolation and purification of viruses which damage fungi of the penicillium genus; their biological, physical, chemical and antigenic properties have been studied.

Basic direction of the work of the Division of Reproduction of Viruses of Plants (director, V. G. Krayev), organized in 1974 is study of the physical chemical properties of plant viruses and their structural components and the features of interaction of viruses with the cell in the process of viral infection.

The division has inquired into the ultrastructure of the cell of a plant damaged by viruses during an individual or mixed infection; it has established the features of localization and distribution of virions in the cell, the content and structure of intracellular viral inclusions during infestation of plants by x- and y- viruses of the potato and some viruses of leguminous plants.

At the present time the division has been examining the intracellular localization of processes of synthesis of virus nucleic acid and proteins, the physical chemical properties and functional features of components of viruses of plants with a fragmented genome.

The basic direction of work of the non-structured Laboratory of Viruses of Algae (director, V. A. Goryushin) is the study of molecular biology of algal viruses. It has discovered and examined viruses of blue-green algae (cyanophages) which lyse a number of single-cell and filar blue-green algae. It has seen the phenomenon of lysogeny in single-cell algae and has found cyanophages which elicit it. A virus has been discovered which damages green alga Chlorella purenoidosa.

In 1963, the institute organized a Division of Physical Methods of Study of Viruses which was later renamed the Division of Biophysics of Viruses

(director, Ya. G. Kishko). In 1977 the division was reorganized into the Division of Molecular Biology of Viruses (director, N. S. Dyachenko).

The division has studied the ultrastructure of a number of viruses of plants and bacteriophages and individual elements of their capsid and isolated nucleic acids. It found polylysogeny of Pseudomonas vignae, caused by doubly discriminating moderated phages (director, Ya. G. Kishko).

In a structural-functional study of the components of DNA-genome viruses and the mechanisms of their reproduction, it was found that the complexity of the antigenic structure of an extension of the virus correlated with the size of the molecule in our composition. Previously unknown antigens have been identified. The devision found a different orientation of a type- and group- specific determinant of hexone in the virion, intranuclear inclusions and capsomers.

The division showed the virus-specific nature of intranuclear inclusions and their different functional role in virus reproduction. New data were obtained on characteristically different action of DNA-genome viruses (adenovirus, several phages) and their components upon an immune system, wherein whole virions and proteins inhibit, while DNA stimulates, the activity of antibody forming cells and of T-lymphocytes (N. S. Dyachenko).

In the 1963-1968 period the institute had functioning Divisions of the Viruses of Animals (director, Academician, AS UkrSSR, S. M. Gershenson), Chemistry of Viral Proteins (director, S. B. Serebryanyy), Chemistry of Nuclear Acids and Viral Carbohydrates (director, V. P. Chernetskiy), the latter becoming the nucleus for creation of a Sector of Molecular Biology and Genetics of the Institute of Microbiology and Virology imeni D. K. Zabolotnyy, converted then into the Institute of Molecular Biology and Genetics, AS UkrSSR.

In all the years of its existence the institute has constantly striven to concentrate scientific cadres and material resources on studies of current problems of modern microbiology and virology and to translate into practise the results obtained in its theoretical work.

The institute has carried out diversified scientific activity in combination with a number of scientific research institutes of the Ukraine and other union republics, it has supported and constantly expanded association with practical work. The institute is carrying on its activity in individual problems at the present time in combination with 68 scientific institutions and enterprises and,also, on the basis of socialist competition with several of them. The institute has been executing five themes in combination with scientific institutions of the CEMA countries (GDR and CSSR).

The institute is conducting great work in the area of preparation of scientific cadres for scientific research institutes, medical, agricultural and industrial institutions; it is also preparing cadres of microbiologists

or virologists for a number of other countries. In the postwar years alone, the institute has trained 28 doctors and over 250 candidates of sciences who are working in various institutions of the Soviet Union, countries of socialist cooperation and developing countries.

The institute systematically conducts republic and general federal school-seminars, symposia, scientific meetings, conferences of young specialists on current questions of contemporary microbiology and virology.

The institute publishes MIKROBIOLOGICHESKIY ZHURNAL (founded in 1934), monographs, thematic collections, methods development for various problems, microbiology and virology. In the last 5 years alone, it published 29 monographs, 13 collections of works, and produced 30 author documents.

On 31 May 1978, the institute was awarded the Order of Labor's Red Banner for services in the development of biological science and training of highly-qualified scientific cadres. The high esteem of the motherland infuses the personnel collective of the institute with ever greater energy to work in the field of biological science and to seek new reserves to increase its effectiveness.

In marking the 50th anniversary of the founding of the institute, the personnel collective is directing its entire activity to fulfillment of the decisions of the XXV Congress of the CPSU and XXV Congress of the CP of the Ukraine, for realization of new tasks of communist construction.

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SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

IN THE EXECUTIVE COMMITTEE OF THE INTERNATIONAL UNION OF PSYCHOLOGICAL SCIENCES

Moscow VOPROSY PSIKHOLOGII in Russian No 1, 1979 pp 143-144

[Article by B. F. Lomov, MSPN Vice President, and E. A. Faroponova, Senior Scientific Secretary, USSR Society of Psychologists]

[Text] A regular meeting of the International Union of Psychological Sciences (MSPN) was held from 26 to 29 July in Vakheyenburg (GDR). The participants of this meeting included A. Sammerfil'd (MSPN president, England), B. F. Lomov (vice president, USSR), R. Dayaz-Guarerro (vice president, Mexico), T. Tomashevskiy (Poland), F. Kliks (GDR), Kh. Gevara (Cuba), Dzh. Nyutten (Belgium), M. Durodzhayte (Nigeria), M. Rozentsveyg (USA), P. Fress (France), Zh. de Monmolenn (scientific secretary of the INTERNATIONAL JOURNAL OF PSYCHOLOGY, France), V. Gol'tsman (MSPN general secretary, USA), K. Pavlin (MSPN assistant secretary), and D. Belanzher (MSPN treasurer, Canada).

The following issues were discussed during the work of the executive committee:

1. The MSPN president's report on the executive committee's work during the year since the last conference.

2. The treasurer's report on the financial status of the MSPN.

3. The MSPN general secretary's report on the organizational activities of the MSPN.

4. Information on the activities of the Committee for Communication and Publication Problems (chairman, M. Rozentsveyg), namely: a) Publication of an international handbook of psychology, b) the international journal of psychology, c) a review of publications on psychology in French-speaking countries, d) translations of the psychology handbook, published in three languages (English, French, German), into other languages.

5. Information on activities of the committee for exchange of apprentices and students (committee chairmen, Prof Sammerfil'd).

6. Information on the MSPN's participation in the International Year of the Child in 1979, the program of which includes an international colloquium on the problem of child development (speaker, Prof Fress), and in UNESCO publications on the problems of educational television.

7. Information on the status of research in special projects: Socialization of children in Africa (Prof Durodzhayte); the role and status of women (Prof Monmolenn); the environment and adaptive behavior (Prof Sammerfil'd); professional ethics (Prof Gol'tsman). UNESCO-financed research is being conducted in all of these projects.

8. The mutual relationships of the MSPN with the International Society of the Social Sciences.

9. Mutual relationships of the MSPN with other international associations.

10. The status of affiliated members of the MSPN.

11. The program of the regular 22d International Congress of Psychology, which is to be held in Leipzig, GDR, 6-12 July 1980 (speaker--Prof F. Kliks).

12. The provisional plan for the 23d International Congress of Psychology in Mexico in 1984 (speaker, Prof R. Dayaz-Guarerro).

13. The place and time of the next meeting of the MSPN's executive committee.

14. Acceptance of new members in the MSPN.

The members of the executive committee visited the Karl Marx University in Leipzig and inspected the facilities in which the congress was to be held.

The executive committee approved the provisional program for the 22d International Congress of Psychology written on the basis of suggestions from national societies within the MSPN membership (Program Committee chairman, Prof Syudov, GDR).

The congress will be held 6-12 July 1980 in Leipzig. The working languages of the congress will be English, French, and German. The scientific program consists of long symposiums, meetings on particular topics, and individual reports. The Program Committee has compiled the list of problems for the symposiums on the basis of suggestions from national psychological sciences in the International Union of Psychological Sciences. The problems for the symposiums, graciously sent to the USSR Society of Psychologists in Russian, are presented below: 1. Methodological fundamentals of psychological theories. 2. Classical and field experimentation in fundamental and applied research. 3. Effect of developmental theory on psychology.

4. Variable measurement methods. 5. Multidimensional scaling and interpersonal differences. 6. The concept of information in psychology. 7. Cognitive processes and eye movements. 8. Psychophysiological evaluation scales and perceptual classification. 9. Multiple coding and the stages of information processing. 10. The concept of language--syntactic structures and semantic content. 11. Memory and cognition--organization of knowledge in the human memory. 12. Individual differences in cognitive processes. 13. Consciousness and communication. 14. Cognitive psychology and organization of learning. 15. The psychology of creativity. 16. Artificial intelligence and cognitive psychology. 17. Intercultural comparisons--theory and methods. 18. Development of speech and communication before speech. 19. Interference in childhood. 20. Developmental aspects of the relationships between cognition, emotion, and motivation. 21. Diagnosis and treatment of retarded mental development in children. 22. Starvation and development. 23. Psychophysiological analysis of personality changes. 24. Analysis of biological rhythms at the psychological level. 25. The limbic system: Activation and alertness--evaluation and doctrine. 26. Asymmetry of the functions of the frontal lobes. 27. Psychophysiological analysis of mental operations. 28. Inborn behavior and heredity--ethological and genetic approaches. 29. Psychophysiological and biochemical bases of memory and learning. 30. Analysis of brain functions in animals. 31. Nonvocal communication. 32. Models of personality development. 33. Social regulation of human behavior. 34. Structural and diagnostic aspects of personality research. 35. Early development and socialization. 36. Cognitive and motivational development in the process of training and education. 37. Differential aspects of ageing. 38. Formation and modification of attitudes. 39. Social interaction and the personality. 40. Attribution processes in social perception. 41. Decision making in groups. 42. Interpersonal perception and conception. 43. Behavior modification. 44. Biological feedback. 45. Neuropsychological therapy. 46. Pharmacological, biochemical, and psychological approaches to the study of schizophrenia. 47. Psychopharmacology and the personality. 48. Cognitive and motivational aspects of activity regulation. 49. Neurophysiological mechanisms of purposeful activity. 50. Planning man-machine systems. 51. Mental loads in activity. 52. Stress and control of stress--psychodynamic and psychobiological approaches. 53. Psychosocial aspects of large families. 54. Symposium in honor of W. Wundt. 55. Theory and methods in the history of psychology. 56. Psychology and its history in different countries.

The National Preparatory Committee (chairman, President of the USSR Society of Psychologists B. F. Lomov) was created with the objective of promoting participation of Soviet psychologists in the 22d congress and encouraging participation of the largest possible number of psychologists working in different institutions and cities of our country. Applications for participation in the congress in all subdivisions of the USSR Society of Psychologists should be sent prior to 1 May 1979 to the National Preparatory Committee: 129366, Moscow, Yaroslavskaya Street, #13, USSR Society of Psychologists.

The organizers of the congress report that only reports on original, previously unpublished projects will be accepted for the program.

Applications must contain the following information: 1) The topic and the number of the problem to which the report applies; 2) the title of the report; 3) the complete names and titles of the authors; 4) the complete mailing address; 5) the preferred language for the report, and other languages possible out of those selected for the congress; 6) the content of the report in 300-400 words (a brief resume). Applications must be typed in Russian and in one of the languages of the congress, in three copies.

The program of the congress foresees presentation of scientific films. Applications for the showing of scientific films must contain the same information as required for reports and, in addition, information concerning the length and technical parameters of the film.

Exhibitions of scientific research apparatus, tests, books, and journals will be organized. Applications indicating the exhibits and the space they require will be accepted by the congress secretariat until 1 May 1979. There are also plans for a small historical exhibition of psychological apparatus. The organizers are interested in proposals and recommendations concerning possible exhibits or good photographs of such apparatus.

The organizers of the congress report that Circular No 2, together with the forms and further information on preparations for the congress, will reach the USSR Society of Psychologists in mid-1979, and copies of it may be requested there.

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SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

IN THE USSR SOCIETY OF PSYCHOLOGISTS

Moscow VOPROSY PSIKHOLOGII in Russian No 1, 1979 p 148

[Article by E. A. Faraponova]

[Text] A regular scientific organizational session of the Central Council of the USSR Society of Psychologists was held 25-26 September in Yaroslavl'. The main issue discussed in detail at the session was that of developing the fundamental principles of creating a psychological service in our country. A report was given on this topic by Yu. M. Zabrodin, and the participants of the discussion included V. I. Voytko, A. A. Krylov, K. M. Gurevich, V. D. Shadrikov, N. F. Talyzina, A. R. Ratinov, B. A. Dushkov, Yu. F. Polyakov, M. G. Zarakovskiy, Yu. T. Gus'kov, and others.

A series of reports on the problems of psychodiagnosis, engineering psychology, and psychophysiology as well as reports generalizing the experience of teaching psychology in VUZ's were given at a special meeting to which students and instructors of the Yaroslavl' State University and the State Pedagogical Institute imeni K. D. Ushinskiy were invited.

The Central Council's resolution on organizing a psychological service in the country was approved in the final meeting. In its resolution, the Central Council approved the work of the Presidium of the Central Council of the USSR Society of Psychologists, the society's regional branches, the USSR Academy of Sciences Institute of Psychology, and other organizations participating in work on the plan for the psychological service in our country. The fundamental organizational principles and the forms and directions of the work of the psychological service, as presented in the report by Yu. M. Zabrodin, were approved.

The Central Council noted that the general methodological foundations and the scientific base now exist for further development of the scientific-methodological and organizational problems of creating a psychological service--from its lowest levels to the executive agencies.

At the same time the Central Council's resolution makes note of the need for writing a master plan for stage-by-stage organization of the psychological service with a consideration for domestic and foreign experience and the typical tasks to be carried out by practical psychologists, as well as the typical forms of organizing psychological services in different areas of public practice (the national economy, education, public health, culture, social control, and so on).

Special emphasis was placed on the need for posing the issue of developing the methodological base, and standardizing and unifying the methods of practical work, consultation, and expert psychological certification. In order that different forms of psychological service could be developed in the country, it would be desirable to attract an increasingly greater number of associated organizations, conduct integrated projects, publicize psychological knowledge, and upgrade the psychological competency of executives in public practice at different levels. The Central Council felt it suitable to begin work on training plans and programs for psychological specialists, for which purpose a special commission on the problems of the psychological service is to be created under the presidium of the Central Council.

Mention was made of the need for providing the scientific psychological grounds for the resources and methods of publicizing the socialist way of life, and for intensifying the ideological function of psychological science in the conditions of the present ideological struggle, which has become more acute.

The regional branches of the Society of Psychologists were asked to prepare their proposals concerning the directions and forms of work of the country's psychological service, and to submit them to the presidium of the Central Council. They were also asked to prepare and conduct a conference on the problems of training personnel for the psychological service in the first quarter of 1979.

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SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

ALL-UNION SYMPOSIUM 'PSYCHOLOGY AND MEDICINE'

Moscow VOPROSY PSIKHOLOGII in Russian No 1, 1979 pp 152-154

[Article by T. I. Artem'yeva, I. A. Dzhidar'yan, and I. I. Chesnokova]

[Text] An all-union symposium devoted to psychology and medicine was held 10-12 May 1978 in Moscow.*

Three basic problems were examined at the symposium: The methodological issues concerning the relationship between medicine and psychology, the problems of medical psychology, and the issue concerning interaction of social and medical psychology.

The symposium was opened by USSR Academy of Sciences Corresponding Member B. F. Lomov, director of the Institute of Psychology. He noted broad use of the methods of the systems approach as an important trend in development of the knowledge of man; he emphasized that the systems approach suggests a new concept of determinism in psychology, which in distinction from the mechanistic, linear definition permits us to consider the variation in levels of mental pheonomena--their multilevel nature, their multiplicity of qualities, and their multidimensionality.

The first day of the symposium was devoted to the methodological problems of psychology and medicine. The principal topic of debate was the issue of the mutual relationships of the sciences--psychology and medicine, and psychology and psychiatry.

The sciences are being integrated in research on the complex problem of man on the firm foundation of Marxist-Leninist philosophy (Ye. V. Shorokhova, Moscow). But this does not mean rejection of the specific approach to the studied phenomena. In their research on man, psychology and medicine are elements of a complex united by common philosophical conceptions and commonness of goals. It was in this connection that the issue of the importance of

*See the collection specially prepared for the symposium: "Psikhologiya i meditsina. Materialy k simpoziumu" (Psychology and Medicine. Materials for a symposium), Moscow, 1978, 436 pages.

the scientist's ideological position was touched upon (A. A. Megrabyan, Yerevan). The situation in American psychology and psychiatry and the trends of their development attest to the exploitation of these sciences for reactionary sociopolitical goals (S. K. Roshchin, Moscow).

The following were isolated as general medical and general psychological problems: The relationship between that which is biological and that which is social; the association between the mind and brain activity; the psychosomatic problem, and the problem of normal versus pathology.

In addition to issues such as organizing a psychological service in medicine and the demands psychologists place on medical practice (A. A. Portnov, Moscow), participation of the latter in treatment of somatic patients and analysis of medical practice with a consideration for changes occurring in the social conditions of life, changes requiring active participation of psychologists in the treatment of patients (S. F. Semenov, Moscow) and their rehabilitation following illness (T. Ya. Khvilivitskiy, Leningrad), reports were given on the need for creating a unified psychological conception of the personality (I. G. Bespal'ko, Leningrad), on delineation of pathopsychology and psychopathology, and psychology and anthropology, on development of their conceptual apparatus (Yu. M. Savenko, Moscow) and on achieving closer mutual ties between medicine and psychology, which have a common task--providing the conditions for normal mental and physiological activity of the personality (G. Kh. Shingarov, Moscow; M. M. Kabanov, Leningrad).

Medical psychologists are now facing a number of tasks concerning research on the features of childhood and adolescence. These include the problems of occupational orientation of sick children or children with a weakened nervous system, and research on the forms of labor compensation and job placement (S. Ya. Rubinshteyn, Moscow).

Summarizing the results of the first day of the symposium, A. A. Megrabyan emphasized the increasingly greater interest in the problem of man and personality. He noted the high theoretical level of the discussion on the problems posed.

The second meeting of the symposium was devoted to a discussion of the problems of medical psychology. The need for making the tasks of medical psychology more specific (its sphere of competency includes all that has a bearing on the psychology of the sick person) and bringing medical doctors and psychologists closer together in their understanding of the object of research were noted (M.N. Kabanov, Leningrad; Ye. D. Khomskaya, Moscow; K. K. Platonov, Moscow), and the association medical psychology has with concrete practical tasks was emphasized (B. D. Karvasarskiy, Leningrad).

F. V. Bassin (Moscow) turned his attention to the complexity of medical psychology's subject and the difficulties it is experiencing in its growth. He distinguished two groups of causes which, in his opinion, are hindering successful development of the science. They include differences in the

languages spoken by medical doctors and psychologists, and the inadequate attention being given to man's internal, spiritual life as the most important component of man's mental activity.

Issues discussed at the symposium included the methodological procedures of diagnosis as one of the main directions in the work of medical psychology, standardization of the methods of classification, of placing patients in particular groups, test validation (I. M. Tonkonogiy, Leningrad; I. N. Gil'yasheva, Moscow, and others), the tasks of psychological research in somatic medicine (V. V. Nikolayeva, Leningrad), and the place and methods of neuropsychology (Ye. D. Khomskaya, Moscow; L. I. Vasserman, Leningrad).

Reports given by B. V. Zeygarnik (Moscow), Ye. N. Kameneva (Moscow), F. I. Sluchayevskiy (Leningrad), and others touched upon a number of controversial issues associated with our understanding of the subject of pathopsychology and its relationship to psychiatry and psychopathology. V. I. Belozertseva (Ul'yanovsk) dwelt on analysis of the historical aspect of the relationship between pathopsychology and psychology. The role of psychology in research on patient rehabilitation was emphasized by M. M. Kabanov and V. Ye. Kagan (Leningrad). M. M. Kabanov examined the basic points of the rehabilitation conception; discussing its development, he emphasized the obviousness of the need for fundamentally reviewing the existing system for training both physicians and medical psychologists. Much room was devoted in the discussion to issues concerning the urgency of developing the psychological fundamentals of psychotherapy (B. D. Karvasarskiy, Leningrad; V. Ye. Rozhnov, Moscow), organization of a psychotherapeutic service within a broad network of polyclinical, sanatorium, and health resort therapy (I. Z. Vel'vovskiy, Khar'kov), the need for creating psychotherapeutic offices in children's polyclinics with the goal of preventing children's neuroses (A. I. Zakharov, Leningrad), organization of an extensive system for monitoring the psychological health of children within the framework of other psychological services in the country (A. Yu. Panasyuk, Leningrad), and investigation of unconscious phenomena from Marxist positions (V. Ye. Rozhnov). Urgent issues brought up in the reports included those of improving and expanding the training of medical psychologists, and intensifying the psychological training of medical doctors (K. K. Platonov, M. M. Kabanov, A. Kh. Lifshits, Moscow, and others).

Concluding the second day of the symposium, Yu. F. Polyakov (Moscow) noted the fact that practical public health has come to deeply recognize the need for psychology's participation in the solution of medicine's pressing problems. The symposium also provided the framework for discovering some weak points in the development of medical psychology today, particularly the lag of scientific fundamental research from the needs of practice, and the evolving disproportion in the structure itself of this science. The methods problem continues to be acute and controversial. Among the most important organizational and practical problems, we can isolate the need for intensifying the planning and coordination of research in medical psychology, for creating a psychological service in medicine, and for solving the problem of training and utilizing personnel.

The third day of the symposium was devoted to the relationship between social psychology and medicine. The specific features of communication between the patient and the physician and between the patient and individuals immediately surrounding him were discussed. Usually medical workers focus their attention on the patient's somatic manifestations, while the psychological factors, among which contact of the patient with his physician and medical personnel is significant, are ignored as a rule (Ye. F. Bazhin, Moscow; L. L. Rokhlin, Moscow, and others). In this connection A. P. Graysman (Moscow) substantiated the validity of the existence of communicology as a science of the art of communication (in individual form or in the form of group psychotherapy). It was noted that considering the patient's way of life is important to diagnosis of mental illnesses, inasmuch as the disease pattern includes not only organic disturbances but also disturbances in the personality's internalized social relationships (A. V. Shmakov, Moscow). Social psychologists and medical doctors must also apply joint effort in preventive psychology, which must take the form of organizing consultative assistance to young people in resolving complex vital issues, in settling various sorts of conflicts, and in resolving the problems of family and marriage (V. K. Myager, Leningrad). The difficulties presently facing preventive psychology were noted: Absence of a personality classification and of suitable research methods, and lack of a classification of conflicts.

The study of emotion-arousing influences in extreme conditions deserves persistent attention. The importance of joint efforts by psychologists, social psychologists, and physician-hygienists in solving a large number of problems concerning the organization of the life and personal needs of people in unusual conditions was demonstrated with the psychological state of a ship's crew on a long cruise as the example (A. R. Steymatskiy, Moscow). T. Ya. Khvilivitskiy (Leningrad) examined cases observed in Leningrad during the time of the blockade. In the extremely difficult conditions of that time, there was growth in neither mental nor somatic diseases. Historical facts of this sort must be analyzed from the standpoint of the relationship between that which is mental and that which is somatic, and between that which is biological and that which is social.

A number of the reports concerned the relationship between social psychology and forensic psychiatry (V. M. Shumakov, Moscow; S. M. Lifshits, Kiev; L. L. Rokhlin, Moscow). The problem of socially dangerous behavior was examined in this connection. Other problems discussed were the need for differentiating pathological deviations from normal psychological deviations in research on the difficult adolescent (I. F. Myagkov, Voronezh), the integrated nature of experimental psychological examination of the patient carried out with the goal of revealing the degree to which the personality is preserved and the possibility for exposing individuals simulating psychological difficulties (I. I. Kozhukhovskaya, Moscow Oblast), the urgency of critical analysis of materials accumulated by foreign social psychologists from the positions of Marxist psychology (P. N. Shikhirev, Moscow), and development of a theory of psychotherapy with a consideration for its psychosocial aspects (V. L. Raykov, Moscow).

Describing the work of the symposium in the section "Social Psychology and Medicine," K. K. Platonov (Moscow) emphasized that the range of problems being discussed, which began with the debate by philosophers, psychologists, and psychiatrists on the consciousness problem (1966), has broadened and risen to the level of interaction of psychology and medicine as a whole.

The symposium demonstrated that medicine has gone beyond the framework of individual psychology, having discovered intimate ties with social psychology.

In their concluding remarks, Ye. V. Shorokhova and V. M. Banshchikov (Moscow) noted the fruitfulness of interdisciplinary discussion of joint problems and expressed confidence in further close contact between medical doctors and psychologists.

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PUBLICATIONS

KEY TO THE RUST FUNGI OF THE USSR

Leningrad OPREDELITEL' RZHAVCHINNYKH GRIBOV SSSR (Key to the Rust Fungi of the USSR) in Russian Part Two 1978 signed to press 22 Feb 78 pp 2-4, 383

[Annotation, Table of Contents, Foreword, and Bibliography from the book by V. I. Ul'yanishchev, Izdatel'stvo Nauka, 384 pages]

[Text] Rust fungi parasitize many agricultural and ornamental plants, and they attack timber stands and windbreaks, causing a significant decline in plant productivity. This key is intended for exact determination of species, which will facilitate subsequent conduct of scientific research and implementation of measures to control rust fungi. This book presents keys for four genera (*Puccinia, Endophyllum, Aecidium,* and *Uredo*) and describes 784 species of rust fungi parasitizing 2,300 plants. Three hundred eight-five figures, 21 bibliographic references.

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Foreword

Among the numerous fungal agents of plant diseases, the rust fungi are extremely widespread, and under conditions favoring their development they often elicit severe damage to many grasses, shrubs, and trees, leading to a significant decline in the productivity of the latter as well as to loss of ornamental qualities.

	Known in the USSR		May be found in the USSR
Fam. Melampsoraceae			
Uredinopsis	9	(7)	8
Milesia	12	(6)	9
Hyalopsora	4	(3)	3
Melampsorella	2	(2)	—
Pucciniastrum	13	(10)	1
Thekopsora	10	(8)	1
Calyptospora	1	(1)	—
Melampsoridium	4	(4)	—
Phakopsora	1	—	2
Physopella	1	—	1
Cronartium	6	(6)	1
Chrysomyxa	13	(13)	1
Pucciniastele	1	(1)	—
Cerotelium	1	(1)	—
Bacodromus	1	(1)	—
Coleosporium	38	(28)	1
Ochropsora	1	(1)	—
Melampsora	46	(35)	3
Chnoopsora	1	(1)	1
Aplospora	1	(1)	—
Subtotal	166	(129)	32

	Known in the USSR		May be found in the USSR
Fam. Pucciniaceae			
Tranzschelia	6	(4)	1
Leucotelium	1	(1)	—
Tranchyspora	2	(2)	—
Gymnoconia	1	(1)	—
Kuehneola	2	(1)	—
Frommea	1	(1)	—
Xenodochus	2	(1)	—
Phragmidium	36	(23)	1
Triphragmium	4	(3)	1
Uropyxis	1	(1)	—
Cumminsiella	1	—	1
Pileolaria	3	(1)	—
Triphragmiopsis	1	(1)	1
Nyssopsora	1	(1)	3
Nothoravenelia	1	(1)	—
Gymnosporangium	14	(11)	3
Blastospora	—	—	1
Uromyces	176	(132)	9
Schroeteriaster	1	—	—
Puccinia	616	(459)	64
Endophyllum	2	(2)	2
Subtotal	872	(646)	84
*Aecidium**	80	(63)	10
Uredo	8	(2)	2
Subtotal	88	(65)	12
Total	1126	(840)	128

Unfortunately it was not until this time that Soviet mycologists, scientists, agricultural specialists, and instructors and students in institutions of higher education have had a "Key to the Rust Fungi of the USSR" available, one necessary for correct determination of the species of these fungi with the goal of implementing particular control measures.

The "Key to the Rust Fungi of the USSR" consists of two parts describing 1,254 species of fungi collected from more than 4,000 species of plants (the names of the host plants are given in the "Flora SSSR" (Flora of the USSR)). Part One was published by Izdatel'stvo "Nauka i tekhnika" (Minsk) in 1975. Part Two, the second publication, contains the basic knowledge of 784 species of rust fungi in four genera--*Puccinia*, *Endophyllum*, *Aecidium*, and *Uredo*.

It should be noted that while Transhel' (1939) cites 840 species of rust fungi found in the USSR, parts One and Two of the "Key to the Rust Fungi of the USSR" provide information on 1,126 species discovered in the USSR.

The table above presents the number of species of rust fungi representing 43 genera known in the USSR as of January 1974, and the number of species which may be found within our country's borders (the number of species known in the USSR prior to 1939, as cited by Transhel' (1939), is indicated in parentheses).

Mycological research is presently being conducted in many republics, krays, and oblasts of the USSR, and we would hope that our information about this interesting and important group of fungi will be significantly expanded in the future and the number of taxons known for the USSR will grow.

This key was compiled on the basis of literature dealing with the rust fungi, to include works by Soviet and foreign uredospore experts as well as herbal materials stored in the herbariums of the USSR Academy of Sciences Botanical Institute imeni V. L. Komarov, the All-Union Institute of Plant Protection, the Azerbaydzhan SSR Academy of Sciences Botanical Institute, the Georgian SSR Academy of Sciences Botanical Institute, and other institutions.

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