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No. 1038

EKO: ECONOMICS AND ORGANIZATION OF INDUSTRIAL PRODUCTION

No. 8, August 1982

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CONTENTS

Table of Contents of 'EKO', No 8, 1982 1

Solomentsev Addresses Siberian Division of Academy of Sciences
(M. S. Solomentsev) 3

Integrating a Comprehensive Program Into the Branch Management System
(A. D. Barskiy) 12

Production Quality Linked to Labor Quality
(A. A. Tkachenko) 23

Problems of, Alternatives to, Assembly Lines Explored
(I. I. Prober) 28

On Making Labor More Attractive
(T. I. Saksakulm) 34

Infrastructure Problems Retard Development of Tungsten Deposits
(I. S. Shepeta) 37

Development of Resources, Industry in East Siberia, Transbaykal
(G. M. Vol'deyt) 44

Feedback's Pluses, Minuses in a Dynamic Planning Environment
(A. F. Myrtsymov) 52

Teaching Resource Conservation 58

Ecology Merits Place as Subject of Study
(P. G. Oldak) 59

Conservation Training's Place in Higher Education
(I. P. Laptev) 62

First Global Intergovernmental Conference on Environmental Education 66

First All-Union Conference on Environmental Education 68

Forming the Ecology-Oriented Thinking of Future Engineers
(V. F. Maksimov, G. V. Stadnitskiy) 70

Economics of Conservation as a Field of Study
(P. M. Nesterov) 73

Ecology Studies Broken Down Into Four Groups
(B. G. Ioganzen) 76

Environmental Protection 'Squads' Discussed
(S. G. Mukhachev) 79

Environmental Education Abroad Reviewed
(G. D. Shadrina) 83

Problems of Dealing With Redundant, Dismissed Workers
(A. M. Dobrusin) 86

More Efficient Use of Managerial Time Needed
(F. Ye. Udalov) 93

Ideal Traits of Foremen Discussed
(N. B. Yegay) 99

Pros, Cons of Flextime Reviewed
(P. G. Klivets) 102

Position of Industrial Sociologists Discussed
(Yu. A. Drobotenko, N. S. Miroshnichenko) 108

Industrial Sociologists Need Access to Better Information
(F. I. Pivovarov) 110

Sociologists Need To Merge Theory With Practice
(N. V. Sekretaryuk) 112

Duplication, Wasted Effort Among Sociologists Observed
(V. A. Tyutyunnik) 113

Studied Approach to Planning, Organizing, Staffing Urged
(R. F. Zhukov) 115

Book on Information Revolution Reviewed
(B. P. Kutyrev)..... 122

Book on Human Communication Reviewed
(A. M. Bernshtam, R. P. Povileyko)..... 125

Urban Development in Siberia
(I. S. Dreytser)..... 128

Aspects of Labor Quality Discussed
(N. Yu. Venevtseva)..... 133

TABLE OF CONTENTS OF 'EKO', No 8, 1982

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 191-192

[Articles not translated in this report are marked with an asterisk (*)]

[Text] Contents

page

25 Years of the Siberian Division of the USSR Academy of Sciences

The Speech of M. S. Solomentsev at a Ceremony Devoted to the 25th Anniversary of the Siberian Division of the USSR Academy of Sciences 3

Improving Planning

The Comprehensive Program in the Sectorial Management Structure - A. D. Barskiy 16

Digests

Brief Journal Information 33, 121, 158

The Enterprise: Daily Routine Full of Problems

The Attitude Toward Product Quality - A. A. Tkachenko 35
Where the Conveyor is Going - I. I. Prober 41
How to Make Labor More Attractive - T. I. Saksakulm 49
Development Lessons - I. S. Shepeta 53

The Prospects of Siberia

Yet Again on the Lessons of Bratsk and the Concentration of Forces in Developing New Territories - G. M. Vol'deyt 61

Let Us Pose the Problem

When Feedback is Weak - A. F. Myrtsymov 75

The Specialist and the Age

Studying Conservation 85
Ecology and the Education System - P. G. Oldak 86
Conservation Training in the Higher School - I. P. Laptev 90

page

The First World Intergovernmental Conference on Education in the Area of the Environment 92
First All-Union Conference on Education in the Area of the Environment 95
Shaping the Ecological Thought of Future Engineers - V. F. Maksimov and G. V. Stadnitskiy 98
For Conservation Economics--Its Own Specialists - P. M. Nesterov 102
* A New Chair at Moscow State University 105
Ecological Education Should Begin in Primary School - B. G. Ioganzen 106
Environmental Protection Squads - S. G. Mukhachev 109
Ecological Education Abroad - G. D. Shadrina 114
* Ecology Studied Throughout the World 118

Socioeconomic Problems of Labor

Personnel Work
Work With the Personnel; The Cutback Order, the Hiring Order: Many Problems are Concealed Behind Them - A. M. Dobrusin 123
The Leader's Race Against Time - F. Ye. Udalov 134
The Authority of a Foreman - N. B. Yegay 141
Flexible Working Time - P. G. Klivets 144

Replies to the Article by V. A. Skripov "Notes of a Plant Sociologist," EKO, No 11, 1981

Enterprise Specialists Discuss
In Search for a Generalization - Yu. A. Drobotenko and N. S. Miroshnichenko 151
The Sociologist: At the Sources of Information - F. I. Pivovarov 153
To Specialize in Sociology - N. V. Sekretaryuk 154
The Closest of All to Sociology - V. A. Tyutyunnik 156

Advice to the Businessman

A Self-Monitoring Method for Subdivision Leaders - R. F. Zhukov 160

Among the Books

The Echo of the Explosion of the Megabit Bomb - B. P. Kutyrev 169
These Unsimple Communications Networks - A. M. Bernshtam and R. P. Povileyko 172
The City in Siberia - I. S. Dreytser 176
What Is the Quality of Labor? - N. Yu. Venevtseva 182

The Reader and the Journal

* A Conference in Pavlodar - L. V. Busygina 187
* The Best Materials of 1981 189

In Preparation for the Next Issue 190

10272
CSO: 1820/1

SOLOMENTSEV ADDRESSES SIBERIAN DIVISION OF ACADEMY OF SCIENCES

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 3-15

[Speech by Candidate Member of the Politburo of the CPSU Central Committee and Chairman of the RSFSR Council of Ministers M. S. Solomentsev in the presentation of the Order of Lenin to the Siberian Division of the USSR Academy of Sciences]

[Text] The bold state experiment which started a quarter of a century ago of creating a powerful scientific potential in the East of the nation has become a vivid example of the enormous possibilities of our society in carrying out future tasks.

Time has defined the value of this experiment for the nation. The Siberian Division of the USSR Academy of Sciences has been awarded the Order of Lenin. At a ceremony in Novosibirsk held on 5 June 1982, the Candidate Member of the Politburo of the CPSU Central Committee and Chairman of the RSFSR Council of Ministers S. M. Solomentsev presented the high award to the large detachment of scientists, engineers, workers and graduate students.

Dear comrades! Today is a memorable event in the life of the scientists, the community and the workers of Siberia. The Order of Lenin is being presented to the Siberian Division of the USSR Academy of Sciences for successes in conducting scientific research, for the training of highly skilled scientific personnel and for a major contribution to developing the productive forces of Siberia.

It is worthy of note that your fully enthusiastic and creatively energetic multinational collective has received this award during the jubilee year of the 60th anniversary of the formation of the USSR.

With profound satisfaction I carry out the instructions of the Politburo of the CPSU Central Committee, the General Secretary of the CPSU Central Committee and the Chairman of the Presidium of the USSR Supreme Soviet, L. I. Brezhnev, in extending to the participants of the ceremony, to the scientists, the scientific and technical workers and graduate students, to your entire glorious collective, sincere congratulations on this high award of the motherland, in wishing you new creative accomplishments.

In noting the great accomplishments of the scientists at the Siberian Division, L. I. Brezhnev emphasized that these successes are the result of bold scientific research

and discoveries as well as unstinting hard work. He expressed confidence that the contribution of Siberia's scientists to the development of Soviet science and to carrying out the tasks posed by the 26th CPSU Congress in the future would grow continuously. Having paid particular attention to the importance of active involvement by Siberia's scientific institutions in carrying out the USSR Food Program, Comrade L. I. Brezhnev wished the Siberian scientists successful and fruitful work in this national cause.

Comrades! In accord with the instructions of V. I. Lenin, the Communist Party and the Soviet government from the very first days of the existence of our state have devoted unflagging attention to the development of the nation's eastern regions. The 26th CPSU Congress also strengthened this fundamental strategic party line.

The prediction by the inspired Russian scientist M. V. Lomonosov that Russian might would be augmented by Siberia has now gained concrete, visible confirmation. Three quarters of the known reserves of coal, oil and gas, more than one-half the potential hydropower resources and reserves of timber, and a goodly quantity of nonferrous and precious metals, diamonds and arable land in Siberia have been added to the riches of the USSR by the will of the party and by the labor of the workers, the peasants and intelligentsia.

The party highly regards the outstanding role which Soviet science has played in developing the productive forces of the nations and its eastern regions. Having become a direct productive force in a mature socialist society, our science takes an active part in creating the material and technical base of communism and is aiding the party in shaping the spiritual world of the Soviet people, in strengthening the authority and influence of the world's first socialist state.

At present, after the passage of a quarter of a century since the organizing of the Siberian Division of the USSR Academy of Sciences, this major scientific center of the nation, one can clearly see how wise and farsighted was the decision of the party and the Soviet government to significantly strengthen the scientific and technical potential of Siberia, how effective was the help to this new undertaking by the party and state bodies and what enormous attention the USSR Academy of Sciences has given and does give to the scientific center in Siberia.

The rapid creation of scores of scientific institutions and the experimental and industrial base of science are within the reach of only our socialist society which possesses a strong economy as well as highly skilled and dedicated personnel for this.

The past years have convincingly shown what ardent patriotism, scientific motivation and enthusiasm were manifested by the Soviet scientists who, upon the party's appeal and out of an awareness of their civil duty to devote themselves to the noble task, the task of scientific development in Siberia. The Order of Lenin which the Siberian Division has been awarded is the paying of profound respect to the scientists who became the pioneers of major Siberian science. With great respect we mention the names today of the academicians who were the first to arrive in Siberia, M. A. Lavrent'yev, S. L. Sobolev and S. A. Khristianovich who made a weighty contribution not only to the development of Siberian science, but also to the progress of world science.

The high prestige of Siberian science has been established by the works of the outstanding mathematicians and specialists in mechanics, physicists and chemists, biologists and economists, geologists and historians who have worked and are working here now.

At present, the institutes and laboratories of the Siberian Division employ a new generation of scientists who have taken over the baton from their famous teachers. In relying on the rich traditions and purposeful creative search, they are blazing new paths in science and are steadily seeking to introduce the scientific achievements into the practice of communist construction.

The works of Siberian scientists in the theoretical and applied areas of mathematics and mechanics, nuclear physics and semiconductor physics, quantum electronics, the theory and practice of catalysis, in studying the processes of combustion and explosion and in works on genetics and breeding have been recognized as major scientific developments and outstanding results. They are being employed with great benefit in the extracting industry and machine building, in agriculture and in the development of transportation and communications. The efforts of the Siberian scientists and their fundamental research in the area of earth sciences are undoubtedly responsible for the fact that our nation has emerged in first place in the world in oil production and has achieved high indicators in gas output.

Advancement in such important areas as powder metallurgy, the use of anticorrosion surfaces, laser, plasma and pulse engineering, the obtaining of super-pure, super-hard and other new materials and the employment of effective control methods--these and many other results of your work have created the prerequisites for a major reorganization of production in a whole series of national economic sectors and have provided a major economic effect for the nation. By concrete deeds the Siberians have affirmed the profound meaning of the saying that there is nothing more practical than good theory.

The Communist Party and the Soviet government have had high praise for the achievements by scientists in the Siberian Division of the USSR Academy of Sciences. Some 14 of them have been awarded the title of Hero of Socialist Labor and more than 700 persons have received governmental decorations. Among the division's scientists are 63 winners of the USSR Lenin and State Prizes, 18 winners of the prizes of the USSR Council of Ministers, 21 young researchers have received the prizes of the Lenin Komsomol and 25 scientists have received prizes and medals of the USSR Academy of Sciences.

Our nation is proud of its scientists and pays proper due to their outstanding accomplishments.

The awarding of the Order of Lenin to the Siberian Division of the USSR Academy of Sciences with full justification can be considered a solemn event in the life of all the scientists and all the scientific collectives in Siberia. The division's activities have helped to form scientific centers in the Urals and the Far East and to establish the Siberian divisions of the VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin] and the USSR Academy of Medical Sciences. Close creative ties link the Siberian Division and the VUZes, and the entire diversified structure of sectorial scientific, design and research institutions in the East of the RSFSR.

The decorating of the Siberian Division of the USSR Academy of Sciences is a noteworthy event also for the collectives of the construction organizations, particularly Sibakademstroy [Construction Administration for the Siberian Division of the USSR Academy of Sciences] which erected the Novosibirsk Akademgorodok and many other scientific centers in Siberia and the Far East.

Allow me, dear comrades, to congratulate you on this general solemn occasion which marks the successes of the large collective of scientists, engineers, technicians and workers, that is, everyone who by his labor contributes to the new victories of Soviet science and increases Siberia's scientific contribution to the great cause of building communism.

Comrades! As V. I. Lenin emphasized, in summing up the results of the distance traveled, it is important not only to see the successes, but it is also essential to focus attention on the unsolved problems and on what still remains to be done. In carrying out such an approach, one cannot help but say that along with the great achievements of the Siberian Division's successes, we are confronted with many problems which await their solution. And this is quite natural. The more science gathers strength and the farther the horizons of its search extend, the larger, the more complex and responsible the tasks the party and state raise for it.

Clear goals for organizing all the work of Soviet science, including the Siberian Division, have been outlined by the decisions of the 26th CPSU Congress, the plenums of the party Central Committee and have been disclosed in the works and speeches of L. I. Brezhnev. The spheres which merit the closest attention by the Siberian Division of the USSR Academy of Sciences have been outlined in the decrees of the CPSU Central Committee and in the decisions of the Soviet government where they mention the future and current tasks of the Siberian scientists in close relation to the problems of the entire region's development as a major component part of the single national economic complex of the country.

In the future, we must ensure the more rapid development of fundamental research which helps in forming and significantly increasing the scientific potential of our society, serves as a source for fundamentally new technical and production ideas and leads to a fundamental transformation of our nation's productive forces.

As was emphasized in the party decisions, the acceleration of scientific and technical progress is a key problem in economic development at the present stage. The accomplishments of Soviet society on this level are great. They have made it possible over the last 10 years to virtually double the volume of material production.

The Siberian scientists have also contributed largely to scientific and technical progress. However, it must be recognized that the results of research, even discoveries and inventions, are not always put into production with sufficient speed. Unfortunately, there have been frequent instances where the developments of scientists and designers have lain idle and this, in essence, means the idling of the most precious social capital, intellectual potential. We were convinced of this again at an exhibit where the Siberian Division's scientists demonstrated their developments and devices, machines and instruments which even now could solve many problems in the development of technology and in raising labor productivity and could carry out many national economic and very important tasks which confront the nation. It is important to more quickly introduce this into production.

The 26th Party Congress unambiguously posed the demand of more closely linking--economically and organizationally--the scientific research and design work with production. The integration of science with production, as was stated in the Accountability Report of the CPSU Central Committee, is an imperative demand of the modern age.

To the honor of the Division's scientists, it must be said that they have undertaken energetic measures aimed at removing the barrier between science and production. Here of important significance has been the "going into the sector" and this has been given, and still is being given, a great deal of attention by Academician G. I. Marchuk who headed the Siberian Division.

But, dear comrades, we would sin against the truth if we thought that the problem of carrying out scientific research and design developments was already resolved. We must search further for new forms of cooperation between the scientific institutions and the enterprises and organizations and we must shorten the time required for introducing completed scientific research into production. Life urgently demands a closer link between the scientists and the Union and republic ministries and departments.

An essential feature in the present stage of national development is the shift in the location of the productive forces to the east and to the north. As you know, there are many reasons for this and one of them is the great natural potential the discovery of which is aided by the successful search of the Siberian scientists.

At present, Siberia is responsible for around 10 percent of the USSR social product and national income. This is proportionally more than the share of Siberians in the nation's total population. However, one must also consider another factor, namely: Siberia is 30 percent of the entire Soviet territory. From this it follows that there still remains much to be done in order that the contribution of the eastern regions to national economic development fully conform to their great possibilities.

The extracting sectors are now being developed at the highest rate. Siberia has assumed the entire increase in the output of oil and gas and is compensating for the decline in their output in other areas. Such a situation raises the responsibility resting on everyone who by his scientific research, search and development must ensure the discovery of new mineral reserves as well as their comprehensive, more complete utilization. Allow me to express my confidence that the scientists and specialists in the area of earth sciences with even greater tenacity will achieve high results from their work and put new Siberian mineral wealth into the service of the motherland.

The shift to the east in the placement of productive forces also poses the important task of developing a number of sectors in the manufacturing industry and producing machinery and equipment adapted for the specific conditions where they are to be used. We should point out that the Siberian scientists have done a great deal to ease the labor of drilling workers, construction workers, transport workers and workers in other sectors. But life poses constantly new tasks and the national economy expects science and above all the Siberian scientific centers to provide a solution.

It is essential to develop materials, production processes and machines which would make it possible to achieve the highest labor productivity and a significant savings in labor resources. Of particular importance also are the energy-saving and waste-free production methods. Here it is important not only to develop dependable machines and mechanisms and progressive production methods, but also show professionalism and tenacity in rapidly introducing them into production. It must not be forgotten that it is very important for a socialist society to consider what expenditures are needed, for example, for producing electric power, smelting aluminum or producing oil- and gas-derived chemical products in the new areas.

It must be said that the economists and designers have aided greatly in settling the questions of the rational placement of the productive forces in the Siberian and Far Eastern regions. But the unprecedentedly large scale of changes increases the measure of responsibility resting on everyone who is involved in the elaboration of the plans and their implementation. This responsibility is related not only to how progressive are the ideas which go into the initial calculations, but also what expenditures are needed for actually carrying out these ideas.

It is essential that the new plans exclude previously detected shortcomings and that they help make the work of the Siberians maximally productive and everyday life fully up to modern demands. It is very important that the authors of plans and developments and the entire scientific community show a maximum of principledness, tenacity and implacability for shortcomings on these questions.

The accelerated development of Siberia's productive forces gives additional acuteness to one other problem which in essence is of state-wide significance. This is the greatest possible rise in agriculture and the supplying of sufficient food products for the public and raw materials for industry.

The scientific collectives of the Siberian Division of the USSR Academy of Sciences and the Siberian Division of the VASKhNIL are doing a good deal to increase the effectiveness of the agrarian sectors and improve the supplies for the public from local production. New major tasks in agricultural development were posed for science by the decisions of the May (1982) Plenum of the CPSU Central Committee and the Food Program worked out and adopted upon the initiative of Comrade L. I. Brezhnev.

As was emphasized in the decisions of the May Plenum of the CPSU Central Committee, an important condition for successfully carrying out the USSR Food Program is an acceleration of scientific and technical progress in agriculture and in all the sectors of the agroindustrial complex as well as the strengthening of its physical plant. Naturally, here the role of scientific research of both a fundamental and applied nature will grow immeasurably. The scientists, including the Siberian scientists, must intensify their work in developing new varieties and hybrids of agricultural crops, in working out and introducing industrial production methods and in preparing scientifically sound recommendations for further improving specialization, concentration and interfarm production cooperation as well as introducing progressive forms of the organization of labor.

In the decisions of the May Plenum of the CPSU Central Committee, particular attention was paid to the need to develop theoretical research on the problems of genetic engineering in the breeding of plants, microorganisms and animals, the biotechnology of synthesizing protein and biologically active substances as well as in developing effective agents for plant protection and growth regulators. The task has also been set of carrying out major scientific developments on the border area of sectors in the agroindustrial complex and related to the storage and processing of agricultural products. It would be a very good thing if our scientists and specialists suggested to us how it would be possible to grow enough grain and other food products under the difficult weather conditions which frequently occur in Siberia. This is particularly important.

At present, we must more thoroughly analyze, study, or to put it more accurately, scientifically reason out advanced experience and achievements which exist in each

oblast, kray or autonomous republic. We feel that the scientists could work out a procedure for widely introducing these into agricultural production practices. Here it is a question for everyone: both the representatives of the natural sciences and the social sciences.

As you can see, the tasks are great and complex. For successfully carrying them out we must have coordination of actions and the concentrating of efforts by many scientific collectives and not only in the agricultural area, but also other areas of science.

Comrades! Major scientific forces are concentrated in Siberia. There are around 120 scientific institutions in just the divisions of the USSR Academy of Sciences, the VASKhNIL and the USSR Academy of Medical Sciences. All the VUZes and sectorial scientific institutions have skilled personnel. They are capable of solving the most serious scientific problems. This can be seen from the elaboration and implementation of such a large-scale, comprehensive program as the Siberia Program.

Obviously, in the process of carrying out this program it would be natural to have the further integration of Siberian scientific forces, the inclusion of an even broader range of organizations in this work and the development of new and the strengthening of existing organizational forms for cooperation between the scientific institutions, regardless of their departmental affiliation. The Siberian Division of the USSR Academy of Sciences must further and with greater activeness coordinate the efforts of participants in joint research.

The coordinating of efforts by the Siberian scientific institutions plays an important role also in training personnel for working in the East of the nation. You have acquired interesting experience in this major question which is directly linked to the future of science. The close ties of the scientists with the general education schools and the specialized secondary and higher institutions of learning make it possible to find talented youth and broaden the opportunities for attracting them into science.

The Siberian Division can and should broaden the training of scientific personnel. Here it is a question not only of satisfying the internal needs of the academy institutes, but also the growing needs of the economy in the autonomous republics, autonomous oblasts and okrugs and all the krays and oblasts of Siberia and the Far East.

Obviously, the carrying out of the tasks presently confronting the Siberian Division of the USSR Academy of Sciences requires primarily the mobilizing of all the forces of the scientific collective. At the same time, the superior scientific organizations, the ministries and departments, the local party and soviet bodies and economic organizations must provide substantial aid in organizing the work and in improving the working and domestic conditions for the scientists.

Of particular importance is a strengthening of the experimental production facilities of science and the development of the design and engineering bureaus and experimental production. This would make it possible to introduce the results of fundamental and applied research into the national economy quickly and with a maximum effect.

In paying tribute today to the Siberian Division of the USSR Academy of Sciences on the occasion of presenting it with the Order of Lenin, we with great satisfaction note the atmosphere established in the collective of principledness and sincerity, a

desire for creative search and a readiness to devote oneself fully for the sake of carrying out the tasks posed by the party.

The work of organizing the collectives of the Siberian Division fell on many prestigious and famous Soviet scientists, academicians and corresponding members of the Academy of Sciences who assumed the role of the organizers of science and the indoctrinators of youth.

From the first days of the formation of the Siberian Division, its Presidium became the true center for organizing the scientific work, one might say, its staff. Allow me to congratulate the members of the Presidium and its chairman V. A. Koptyug on today's ceremony and to wish them further successes in the noble activity in the field of science and in indoctrinating new generations of Soviet scientists.

In creating the close-knit collective of the Siberian Division, as in the life of any cell of our society, the primary role is played by the party organizations. The communists have established a party approach to carrying out the tasks confronting Siberian science. With every justification it must be said now that the successes and accomplishments of the Siberian scientific institutions are directly tied to that daily aid and constant attention which the Novosibirsk CPSU obkom and all the Siberian party kraykoms and obkoms have given to science and to the scientists. There is no doubt that this attention in the future will be one of the factors determining the on-going advance of Siberian science.

Dear comrades! Present here is a broad group of persons involved in the organizing of science in Siberia. They are the representatives of the scientific institutions, the party, Komsomol and trade union organizations. On behalf of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers and from the Government of the RSFSR, accept cordial congratulations on the 25th jubilee of the Division and this high governmental decoration. May I request that you pass on the congratulations and best wishes to all the scientists, scientific and technical co-workers of the Siberian Division of the USSR Academy of Sciences. May you have new creative successes and great happiness!

Allow me to express the confidence that the scientists and co-workers of the Siberian Division of the USSR Academy of Sciences by their unstinting labor will, as always, strengthen the force and might of the Soviet nation, make a weighty contribution to strengthening the positions of the USSR on the world scene and help in successfully carrying out the domestic and foreign policy of the CPSU.

[Editors' note] To the applause of those present, M. S. Solomentsev fastened the Order of Lenin to the banner of the Siberian Division of the USSR Academy of Sciences.

The ceremony was also attended by the Deputy Chairman of the USSR Council of Ministers, the Chairman of the USSR State Committee for Science and Technology, Academician G. I. Marchuk, the President of the USSR Academy of Sciences, Academician A. P. Aleksandrov, the First Secretary of the Novosibirsk Party Obkom A. P. Filatov, the Vice President of the USSR Academy of Sciences and Chairman of the Presidium of the Siberian Division of the USSR Academy of Sciences, Academician V. A. Koptyug, as well as the leaders of the Division's affiliates and institutes. The speakers vowed that the Siberian scientists would devote all their strength, knowledge

and experience to accelerating scientific search, to further developing the region's productive forces and to tapping its natural resources.

10272
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INTEGRATING A COMPREHENSIVE PROGRAM INTO THE BRANCH MANAGEMENT SYSTEM

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 16-32

[Article by A. D. Barskiy, senior science associate from the Central Mathematical Economics Institute of the USSR Academy of Sciences in Moscow: "The Comprehensive Program in the Sectorial Management Structure"]

[Text] In recent years, a whole series of directive decrees has been adopted and these are of the nature of comprehensive programs. A larger portion of them involves the fundamental aims in the socioeconomic development of Soviet society and has a long-term nature. However, the drawing up of the program and its approval in the form of directives are only the first stage of this work. There then arise the tasks of incorporating the program in the national economic plan, its balance coordination in the plan and the controlling of its implementation. Thus, the programs should be carried out not in addition to or above the national economic plan, but rather from its resources. Such an approach turns a program into an organic planning element.

Similar approaches to an understanding of the role of the programs in a planned economy are also being developed in the other socialist countries. In the CEMA countries, a concept of the program has come into being as an instrument basically of long-term planning where "programs are a sort of skeleton for the long-range plan."[1]

The linking of the programs with the various levels of a national economic plan--long-term, medium-term and current--represents a major methodological problem. Thus, in the stage of long-range planning, the elaboration of comprehensive programs involves primarily the disclosure of the major goals.

Often the programs which at first glance have a sectorial or regional importance assume national economic status in their more complete elaboration. The well-known specialist in the regional planning area, Doctor of Economic Sciences R. I. Shniper[2] as an example of a sectorial program which has assumed national economic significance cites the creation of metallurgical capacity in the East of the nation, or the so-called Urals-Kuznetsk Problem. A powerful production installation arose which provided an impetus to the development of metallurgy, chemistry, machine building and other industrial sectors. The Urals-Kuznetsk Industrial Center has played a key role in the development of transportation, other sectors of the production and domestic infrastructure, in the social and cultural rise of the region and the adjacent territories.

The solving of such problems requires, as a rule, special measures and essential changes in the economic structure as well as the involvement of significant additional resources. The elaboration of the draft comprehensive programs makes it possible, thus, to realize Lenin's principle of the leading elements of a plan on the basis of which the basic rates and proportions of national economic development are set.

In the stage of developing a medium-term plan, the program decisions are adjusted depending upon the actually existing internal and external conditions. Simultaneously, the basic plan ideas are concretized and the amounts of resources to be allocated for the program and nonprogram parts of the plan are clarified. Here different variations are possible. The problem is that the implementation of comprehensive programs, as a rule, is longer than a period of medium-term planning, that is, 5 years.

It is particularly difficult when the start of implementing a program does not coincide with the start of a planning period. The carrying out of a program can then be commenced only with definite reserves in a plan. For example, Hungary has adopted a procedure whereby for the programs which are to begin to be carried out in the second half of a five-year plan, the specific quotas are not incorporated in the plan, if preparations for them have not made sufficient headway. In so doing, a reserve is established in the plan and this can be used in carrying out the program.

In the stage of current (annual) planning, the comprehensive programs in a certain sense lose their "individuality," being dissipated in the specific quotas of the annual plan.

The Organizational Structure of the Programs

The accentuation in the research on the specific program approach is now being shifted to the methods of implementing the programs. Here two interrelated areas present themselves: the search for the necessary solutions in the sphere of the organizational management structures and the elaboration of the economic conditions for implementing the programs.

If one disregards the instance of creating a special organizationally structured group of enterprises and organizations concentrated on carrying out a national economic program, then specific program management can be superimposed on the existing system of territorial and sectorial management. This circumstance is manifested differently in organizing the management of the comprehensive programs.

For example, in working out a development program for agriculture in the Nonchernozem area, a decision was taken to set up a strong comprehensive self-financing organization, the Main Administration for Land Reclamation in the RSFSR Nonchernozem Zone (Glavnechernozemvodstroy) as part of the Union Ministry of Land Reclamation and Water Resources. This glavk [main administration] simultaneously is also under the RSFSR Council of Ministers. In the interests of increasing the role and responsibility of the glavk, it is headed by the USSR first deputy minister for land reclamation and water resources; at the same time, he is the deputy chairman of the RSFSR Council of Ministers. [3]

In working out the comprehensive program "The Conservation of Nature and the Rational Use of Natural Resources in Latvia for 1976-1980," serious attention was

paid to forming a "full-powered middle management level which could become the connecting link between the executors of the individual particular conservation measures and their comprehensive review on the republic-wide level."[4] The proposed system for managing the program was based on the already existing republic economic management bodies. Overall leadership over the program was entrusted to a deputy chairman of the republic council of ministers and he simultaneously was to be the chairman of the Commission of the Council of Ministers for Conservation. The republic Gosplan acted as the client, and the Gosplan together with a specially organized special-program council formulates the basic problems and goals of the program and subprograms.

However, as experience shows, the isolating of special elements in an organizational management structure does not completely solve the problem of effectively carrying out the adopted program. The economic objects which are part of the program measures thus become elements of a certain "matrix" structure. They receive control pulses both from their line (sectorial, regional) leadership as well as from the organizers of the program. As a result, they are influenced by at least two, often different-directed, effects.

On the one hand, there are the interests of the sector or region and on the other, the program's goals. It is natural to assume that ultimately the interests will prevail of that structure within which the program element operates. This, of course, does not mean that the program goal will be fulfilled but it will be given a certain "tilt" toward departmental interests. In those instances when a special management organization is set up for carrying out the program, without having its own production base (since it does not belong to the sectorial structure), this organization has available to it certain assets and plays the role of the client to the executor departments and enterprises.

The Program and the Sector

In the USSR and other socialist nations, a rather extensive list of comprehensive programs has been worked out. Definite experience has also been acquired in realizing them. One of the urgent tasks has been to generalize this experience and work out the methodological questions of managing the comprehensive programs.

The problems of managing a socialist economy have been examined rather soundly. However, the managerial methods and tools for the socialist enterprises, associations and sectors cannot be applied in an unaltered form to such diverse objects as comprehensive intersectorial and national economic programs.

In the managing of an economic sector, association or enterprise it is a question of an organizationally, economically and legally formed object with a more or less stable production and management structure and with definite economic rights and duties. The list of executors for a specific program is drawn up depending upon the scheme adopted for implementing it in the course of elaboration, in the stage of incoporating the program in the plan and sometimes in the stage of carrying it out.

As yet, the legal and economic rights and duties of the program executors, its leaders and coordinators have not been defined. As for the organizational support for the process of implementing the programs, the leaders of a specific program in principle

cannot be united by rigid administrative hierarchical ties. The program would then lose its advantages and be turned into one of the many organizationally formed economic complexes with its own particular departmental interests and boundaries.

In certain instances, the establishing of administrative and economic formations to solve urgent problems related to socioeconomic development is undoubtedly justified. Sometimes the solution to the problem can be ensured only by setting up a permanent administrative-economic structure with the appropriate production capacity oriented at satisfying a stable, sufficiently clearly expressed socioeconomic need.

Here an example could be the comprehensive program for setting up a dependable and balanced feed supply for livestock raising. For carrying out the program, feed production was turned into a specialized sector of agriculture.[5] Within the USSR Ministry of Agriculture, a glavk was formed for the production of feed and feed supplements.

It is a question of managing comprehensive programs as a process where the executors of the individual assignments are relatively independent and can be brought together only for the time of implementing the program as a result of special organizational efforts. In actuality, the enterprises and associations involved in carrying out the program aims continue to operate within the existing system of affiliation. Since all the aims or quotas are equally important for the enterprise, a decision involving one or another program can be given to the executors like any other. A program quota is not given any priority with the exception of an administrative one. However, an administrative preference can be established only by a superior organization. The management of the program thereby assumes a vertical or linear nature.

An intersectorial comprehensive program which is of the greatest theoretical and practical interest gives rise to horizontal relations which are hard to sufficiently ensure by a linear management scheme. Thus, around 200 organizations from 45 ministries and departments are involved in carrying out the comprehensive scientific and technical program prepared for the 11th Five-Year Plan for the development of powder metallurgy. Even in 1981, major failings, a lack of synchronization and difficulties in meeting the program targets were discovered. One of the program's leaders, the director of the institute for materials sciences of the Ukrainian Academy of Sciences, Academician of the Ukrainian Academy of Sciences V. Trefilov has pointed out: "...The dates have not been met for delivering equipment to Europe's largest Brovary Powder Metallurgy Plant (BZPM) as a number of enterprises of the Ministry of Heavy Machine Building have refused to accept orders for this equipment from the BZPM and the other organizations of the USSR Ministry of Ferrous Metallurgy." Furthermore: "The failures to meet the dates for carrying out work stages, particularly in the area of intersectorial ties and reciprocal, previously coordinated actions and deliveries, are fraught with very undesirable consequences. The nonfulfillment of even a portion of the planned work causes a chain reaction of unforeseen trouble to the point where, for example, the already built shops and installed equipment end up dead capital since the previous stages for some reason were not completed on time."[6]

Consequently, the horizontal relations established between the enterprises and organizations involved in the program should have an economic nature, that is, effectively coordinate the economic interests of its co-executors. This is all the

more essential as the program demands, in being filtered through the sectorial management structure, are distorted in favor of sectorial interests. The former chief of Bratskgesstroy [Bratsk GES Construction Administration], A. N. Semenov, in speaking at an All-Union Conference on "Specific Program Methods in Planning and Management in Light of the Decisions of the 25th CPSU Congress," pointed out that the experience of building the Bratsk-Ilimsk TPK [territorial production complex] shows the significant difficulties which must be overcome in forming the capital investment structure and volumes. The investment policy of the sectorial management and planning bodies, in being oriented at the predominant development of enterprises in the sectorial specialization, has often led to a lag in the development rate of the production and social infrastructure.

A similar situation developed in the course of building the Kansk-Achinsk TPK, where a lack of coordination in the efforts of individual departments led to disproportions between the construction of the housing-utility and production projects. The director of the Berezovskiy GRES-1 which is under construction, V. Popkov, has admitted: "...We were wondering how to build the temporary settlement. It was no model city. Everything was done according to the worst variation where the production projects went up while the building of housing lagged behind. And we began to fuss about temporary housing." [7]

The First Secretary of the CPSU Krasnoyarsk kraykom, P. Fedirko, has proposed: "There is one way out. At complexes similar to the KATEK [Kansk-Achinsk Fuel and Power Complex], we must have a coordinating body the decisions of which would be compulsory for all the participants in the large-scale and long-term program. These must be independent, so to speak, both of their rank and departmental affiliation." [8]

However, the formation of a special organization for directing a program cannot always ensure the effective coordination of efforts by those involved in implementing it using only the administrative levers. The program's participants are then under a dual administrative pressure (arbitrarily--the program and the sector). In the event of the different direction to the administrative actions, and this cannot be excluded, the administration given the greater rights will prevail. If the leadership of the program possesses such rights, then a threat arises of upsetting the sector's management mechanism. In the opposite case, the enterprises of the sector will ignore the program targets. In the event of an equality of administrative influence from the sector and from the program, the executor enterprise will be guided primarily by its own economic interests.

How to Reconcile Interests

The appointing of responsible program coordinators within the participating departments, in our view, cannot fully ensure the coordinating of the program targets if the coordinators are not given rights comparable with the rights of the departmental leadership. Yet, such a solution would violate the principles of unified leadership. For this reason an important method for reconciling the interests of the departments and the program (generally speaking, the departments and society, since the program directly embodies social interests) is to utilize economic levers.

It is advisable to provide the appropriate institutions (the program committees, curators and coordinators of various levels) with definite economic rights and resources. The resources to be allocated for implementing the program should not be divided among

the executor departments. It makes more sense to concentrate these in the hands of the program's coordinator.

There already is definite experience in this area. Thus, in Latvia in 1979, under the republic council of ministers a special staff was set up for implementing a range of measures to quickly increase meat production and this had the nature of a short-term specific program. This staff was able to concentrate all the resources by mobilizing the internal reserves in the republic ministries and departments. As a result, the republic over a short period of time built livestock installations, the number of hogs was increased by more than 300,000 and meat production increased by 17 percent in 1980 in comparison with 1979.

In the general instance it is advisable that the coordinator pay for the services of the executors from the resources at its disposal. Then the hierarchical relations of the coordinators and executors of the programs are complemented by economic relations.

With such an organization the relations of the parties can change fundamentally and the urgent question arises of organizing competitions to obtain program orders. The competitions can become a reality if the number of programs is small and there is an incentive for the competition participants. The author is aware that the proposal to introduce competitions to obtain projects in the present economic situation may be disputed. However, we feel that the possibility of an economic maneuver to ensure the development of the enterprise and the primary satisfying of its needs can serve as a sufficiently strong incentive for the collectives and their leaders. On the other hand, in our opinion, it would be natural to provide privileged conditions for the collectives which have set to solving problems the importance and social significance of which are confirmed by the very fact of working out a national economic program. The obtaining of such privileges should serve as an example for other enterprises and evoke in them a desire to achieve privileged status. It is also important that the privileges are set temporarily as payment for economic risk and for additional effort. In our opinion, the introduction of such a system would make it possible to commence a real struggle against the dictating of terms by the producer and would at least force the participants in the competition to be guided by the consumer's interests.

In Soviet practices, the elaboration of competing plans goes back rather a long time (the competitions of design bureaus in the aviation industry and competitions for major construction projects). However, as yet the competition system has not been employed in the stage of carrying out the projects. This is caused, on the one hand, by the scarcity of many resources and, on the other, by the operating principles of the economic mechanism.

In actuality, the competitive selection of the executors of a project presupposes their free access to the production resources. However, in accord with the existing practice the funds for the resources are assigned to the executor. This deprives the coordinator of an effective lever for influencing the executors. We feel it would be more logical in keeping with the specific program approach to have the resources assigned to the program coordinator who after summing up the results of the competition would turn over the right of using the resources to the immediate executor.

The problem of encouraging potential executors of a program to participate in it is complicated, in addition, by the "privileged" status of the producer vis-a-vis the consumer. In actuality, the producer receives resources virtually gratis, it cannot fully spend the profit and for this reason has little interest in increasing profits. In addition, a significant portion of the profit is turned over to the budget in the form of the free balance. A portion of the profit is frozen and cannot be employed either to encourage the workers or to develop production. In order to broaden or modernize production, it is significantly more important to achieve the including of capital investments in the plan and even if the enterprise does not have money in the development fund it would receive them from the budget.

Consequently, at times it is possible to involve the departments and enterprises in carrying out program projects only by using administrative methods. But such a method far from always leads to the desired results. This is also confirmed by the experience of carrying out comprehensive programs in Latvia where the specific program approach has become most widespread. The First Secretary of the Latvian Communist Party Central Committee, A. Voss, has commented: "Certainly it is no secret that it is at times difficult to coordinate the measures to be incorporated in the long-range programs with the national economic plans and the plans of the ministries and departments or how complicated it is to achieve the unconditional and precise carrying out of already adopted and approved decisions by all the program participants." "It is essential," he continues, "to also elaborate an efficient system for managing the programs and this would clearly establish personal responsibility for each work area and give the executor all the necessary rights." [9]

It might be assumed that an effective method for resolving large national economic problems would be the combining of the centralized setting of the problems and allocating of the material, financial and credit resources with cost accounting for the executors. One of the central elements in organizing the program could be the proposals on methods to bring the interests for the executors of the program projects down to the level of the general state aims expressed in the program. Along with measures of a moral and prestige nature, it is essential to ensure, at least, the equal benefit from the program projects with any other ones. Equal benefit could be achieved by changing the share of profit in the wholesale price of the product (here we are not examining the variation of increasing production profitability by increasing the efficiency of enterprise operations as it is a question of creating equal initial conditions). The ultimate interests of an enterprise are manifested not so much in the profit level as in the amount of funds left at its disposal. The incentives for the executor of a program project can thus be encouraged by influencing the indicators which control the amount of incentive funds (development, material incentive and sociocultural measures). These relate to the deduction rates into the funds and the rates and amounts of deductions into the state budget.

A version of such indicators would help to reorient the economic interests of the enterprises and sectors to carrying out the program projects. The calculation basis for the benefits to be created for them would be the amount of expenditures which the enterprises and sectors must bear in line with the organizing of new production and the expanding of current production.

Resource Support for the Programs

In contrast to economic projects with a stable structure, the management body for a comprehensive program in principle does not have its own production facilities with assigned fixed capital and labor resources. The program's management body can be given monetary resources and only in certain instances, material ones. The fixed capital and labor resources are involved only in carrying out the program projects. The resources are assigned to the economic organizations and for this reason their involvement must be understood as the involvement of economic subunits in carrying out the program projects.

As for financial resources, various methods are possible for the resource support of the program projects. The first method is the specific address one where the resources are assigned for a specific purpose to the executor. This method is most acceptable in creating new production capacity and infrastructure-type projects. Budget financing is the natural channel for their financial support. The advisability of budget financing for the construction of infrastructure projects is also confirmed by the experience of the European socialist nations, including such a nation as Hungary, where, regardless of the fact that since the end of the 1960's the principle of self-financing has been widely used, the nonproduction and infrastructure projects are built using budget funds.

For production-type projects, the methods of repaid financing can also be effectively used. In the same Hungary, for example, in 1976, a state subsidy for capital investments for specific projects was granted indirectly in the form of a profit tax benefit. Another form for maintaining investments in the production sphere is state loans. This specific form of financial support for capital investment resources differs from budget financing in the repayment nature of the loans. In contrast to a credit, a decision on a loan and the amount of it is taken not by the enterprise, but rather by the state bodies along with the taking of a decision on a specific program.

The second method is self-financing. For the specific programs, self-financing can be supplemented by certain preferential (beneficial) elements considering the priority of the measures to be carried out. As has been pointed out, here it would be wise to utilize direct incentive methods such as: reducing the rates and total deductions into the state budget or the centralized funds as well as increase the deduction rates for the incentive funds. We feel that the encouraging of the accelerated growth of enterprise development funds, that is, influencing the long-term interests of the executors, would conform most fully to the nature and essence of the specific programs as long-term measures. Naturally, the potential executor would be more interested in obtaining and carrying out a program project when the project comprises a significant proportional amount in its production plans.

The Program and Its Executor

In working out a mechanism for implementing comprehensive national economic programs, obviously the basic accent should be put on the elaboration of measures which not only and not so much ensure a current effect. Here it is more important that the effect be long-term and cause a permanent desire for the executor to improve the organization of production and introduce the achievements of technical progress. The problem can be resolved by granting the enterprise certain independence in

developing production and primarily the opportunity to expand and modernize production using its own funds on the basis of stable deduction rates. Such rates for the products produced under a program project could be increased.

In the national economic plan it is essential to provide reserves for material support for developing production for the executors of the program projects. Then the resources allocated by society for implementing the program will be received by the executors not gratis but rather depending upon the results of their cost accounting activities. It is essential to create a procedure whereby the advantages granted the executor of a program project would not be unconditional or perpetual.

The program's client (coordinator) should be able to refuse the services of an unconscientious executor with the recovery of the losses suffered. It is essential to create certainty, in the first place, for the effectiveness of the sanctions which would force the executor to respond properly to his obligations and, secondly, that in the event of the refusal of services from an unconscientious partner, the coordinator could find another executor. For this, it is essential to provide an opportunity for the resumption of the competition which could involve enterprises and organizations not fully loaded up with program projects.

The possibility of ensuring stable development of production serves as a sufficiently strong incentive for participation in carrying out the program projects. The enterprise then itself determines how the money of the development fund should be used. There are sufficient grounds to assume that the money of the development fund would be channeled primarily into developing production which corresponds to the aims of the program as precisely these make a significant contribution to increasing the enterprise's own funds. On the other hand, the possibility of ensuring stable development and the improving of production becomes a definite guarantee for a high level of the other incentive funds as well (sociocultural development and material incentive).

The Decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Raising Production Efficiency and Work Quality" opens up broad opportunities to realize such a method for encouraging economic organizations to participate in the state-wide programs. The decree provides increased rates for forming economic incentive funds for the production associations (enterprises) which significantly increase the output of new highly efficient production and technical products and new consumer goods. In a majority of instances, the products produced in carrying out the state-wide programs fall into this category.

It is provided that expenditures from the production development fund "in accord with the figures and proposals of the production associations (enterprises) are to be included fully in the capital construction plan of the ministries and departments and are to be supplied first with the necessary capital investments, material resources and amounts of contracting within the limits of the capital investments, material resources and contracting work set by the appropriate ministry and department."

Another key aspect in carrying out a program is to provide the executor with the necessary material resources. As was pointed out, the allocating of funds for material resources to the coordinator in accord with the overall demand of the program would conform more to the logic of the program approach. As the program projects were

allocated, the right to conclude contracts for the delivery of resources in accord with the allocated funds would be granted to the executors. The executor of a program project would receive certain priority in realizing the funds allocated to it.

In this same group of problems one must obviously put price formation for the components of the program projects. It is a question of articles and services of a nonserial nature for which there are no approved wholesale prices.

It is particularly complex to make prices for comprehensive services involved in the working out and production of a new product, or for creating nonstandard projects the estimated expenditures for which are hard to estimate with sufficient accuracy while the implementing of the program project involves a certain economic risk. The risk, as a rule, is assumed by the client as a representative of the state. However, such a situation does not encourage the executor to seek out the most economic solutions.

Two extreme methods for resolving the question are known. The first of them is that the economic risk is assumed by the client. Then the price for the service can be set in such a manner that the executor is guaranteed the recovery of expenditures plus a certain percentage or amount of profit (if a share of profit is stipulated then the executor will naturally be interested in increasing expenditures). The second method is where the economic risk is assumed by the executor. A contract price is set and this according to the preliminary figures should cover the executor's expenditures and provide it with a certain profit. In the event of a deviation from the planned expenditures, there is either a loss or an additional profit for the executor.

Between the extreme points there can be a broad spectrum of decisions involving a sharing of responsibility and risk between the executor and the client. The choice of the method of price formation and financing depends upon the specific features of the program and the degree of complexity in the program project.

The various methods for allocating responsibility and risk can play a positive role in increasing the economicness and efficiency of carrying out the program projects. In particular, the experience of state programs in the United States indicates that the method of a fixed contract price has often made it possible to substantially reduce state expenditures in comparison with the initial estimates.

Also of interest is the so-called system contract[10] which has become particularly widespread in recent years. Its essence comes down to turning over the order for an involved development to a chief contractor who assumes all the functions in placing the orders among the subcontractors, in coordinating their activities and so forth. The use of such a method in carrying out large programs in a socialist economy would make it possible to raise the economic responsibility of the program's management bodies, increase the overall effectiveness of the program projects and improve current leadership over their implementation.

FOOTNOTES

[1] "Kompleksnyye programmy razvitiya v stranakh SEV" [Comprehensive Development Programs in the CEMA Nations], Moscow, Mysl', 1977, p 16.

[2] R. I. Shniper, "Regional'nyye predplanovyye issledovaniya" [Regional Preplanning Research], Novosibirsk, Nauka, 1978.

[3] "Kompleksnaya programma razvitiya Nechernozem'ya" [A Comprehensive Development Program for the Nonchernozem Area], Moscow, Politizdat, 1977.

[4] M. L. Raman, L. L. Eykhman, D. I. Yevenko, et al., "The Organization of Specific Management for the Latvian Environmental Protection Program," in "Upravleniya realizatsiyey programm (tezisy doklada)" [The Managing of Program Implementation (Paper Theses)], Moscow, 1977.

[5] V. P. Mozhin, "On the Development of a Production Complex," KOMMUNIST, No 13, 1981.

[6] "The 'Materials of the Century' are Born (Under Comprehensive Programs)," PRAVDA, 1 June 1981.

[7] V. Prokushev, "Through the 'Rock Salt' Prism," PRAVDA, 30 May 1981.

[8] P. Fedirko, "The Great Coal of Siberia. The Kansk-Achinsk Fuel-Energy Complex Today and Tomorrow," TRUD, 10 October 1981.

[9] A. Voss, "The Broad Opportunities of Specific Program Planning," KOMMUNIST, No 15, 1981.

[10] "SShA: organizatsiya gosudarstvennykh programm" [The United States: The Organization of State Programs], Moscow, Nauka, 1980.

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PRODUCTION QUALITY LINKED TO LABOR QUALITY

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[Article by Candidate of Economic Sciences A. A. Tkachenko, Docent at the Zaporozhye Pedagogical Institute: "The Attitude Toward Product Quality"]

[Text] In working out and introducing a comprehensive system for product quality control (KS UKP), of great importance are not only the technical and economic, but also the sociopsychological factors, that is, how the employees relate to the new system, how they accept it and how it influences the collective. A special sociological study has been run in order to determine the importance of these factors at a number of machine building enterprises in Zaporozhye and other Ukrainian cities. The study was based upon examining the attitude toward labor in its various aspects, that is, from an understanding of labor as a common human value, including the attitude toward one's profession and working conditions up to the attitude toward the quality of the work performed. In the given article, out of all the questions touched upon in the study we would like to focus on the questions of product quality and the attitude toward it.

In the process of the sampling there were individual talks and the questioning of various employee categories and the primary documents of the enterprise subdivisions were studied and analyzed. As an average, the sampling encompassed at least 10 percent of the personnel. Special questionnaires were distributed to workers, foremen and OTK [Quality Inspection Department] workers.

A total of 2,000 questionnaires were sent out. Some 1,600 were returned after being sent out and of this number 1,576 were suitable for processing. The questionnaires contained questions making it possible to establish the following:

a) The reasons for the occurrence of rejects in work;

b) The social factors influencing the performing of functions by employees;

c) Difficulties in achieving high product quality;

d) The role of workers in achieving a certain quality level in the specific areas or operations;

e) The opinion of workers on what should be done to improve quality;

f) The effectiveness of the measures adopted at the enterprises to prevent poor quality work;

g) The degree of satisfaction with their job;

h) Individual features of the questioned employees.

As the study showed, in approximately 1 case out of 5, the rejects were caused by the workers themselves and every fifth one was the result of insufficient experience. Only 1 out of every 100 was caused by the fact that the job was not to the employee's liking. In the opinion of those questioned, 80 percent of the cases of rejected products were caused by shortcomings in production itself. This is particularly important to be considered in working out and introducing incentive systems for product quality. It happens that the enterprise administration endeavors to encourage better quality in providing incentives for the employees while the defects and rejects do not depend upon them. For this reason, the actual causes of the rejects should be ascertained first. For this, it is advisable to distribute them according to the groups shown in Table 1.

Table 1

Opinion of Workers on the Relation of Product Quality Upon the Quality of Their Work, % of Total

	Average for Enterprises	First Enterprise	Second Enterprise	Third Enterprise	Fourth Enterprise
Depends upon worker	20	20	18	21	22
Does not depend upon worker	75	75	75	73	74
Unknown	5	5	7	6	4

For the four investigated enterprises, the reasons for defects ranking them in their decreasing importance lay in the following order:

1) The primitiveness of the equipment, tools and production process;

2) Shortcomings in the conditions and organization of labor at the work area;

3) The primitiveness of the design of the product, the inaccuracy of technical documents;

4) Mistakes in the issuing of plan quotas by the foremen;

5) The lack of aid from the foreman or production engineer;

6) Mistakes of other workers;

7) Poor quality raw material;

8) A lack of time for inspecting part quality;

9) Insufficient skill.

The ranking shows the possibility and utility of seeking out the true reasons for poor product quality in each specific instance.

The questioning showed that the OTK employees of the enterprises consider as the most essential reasons for defects to be the following: the insufficient knowledge of blueprints and production methods as well as mistakes made in them; inattentiveness in inspections. Such factors as the shortage or insufficient number of inspection equipment, the limiting of inspection time or inexperience, in their opinion, are secondary.

Quality meetings and exercises to improve skills are effective means to prevent defects. The workers themselves for improving quality have proposed that the work areas and production processes be improved, that they additionally study the new products and correspondingly equip the production process, that they increase the personnel of the OTK and improve the relations between workers performing related operations.

The sociological study carried out made it possible to disclose the following practice. In one out of every five instances the development of new equipment was entrusted to workers who had no experience in this area. In approximately the same number of instances the work did not conform to the sociopsychological sets of the executors. Such consequences of development as a temporary loss in earnings, the necessity of changing a profession or skill, the additional studying of theory, the mastery of new equipment or the moving from an old collective to a new one were perceived as very painful for certain workers.

It was established that only one-third of the persons questioned was confident that they could work without defects. At the same time, over the last 3 years, rejects were not officially recorded for 80 percent of the employees at the studied machine building enterprises. Only one out of four enterprises had reject analysis groups and a little more than one-half had standardization and metrology services.

In many of the scientific research and design organizations there are no services for standardization, reliability and durability. There are few designers who have received the right to use a "personal stamp" without supervision. As a rule, the designers rarely aim for the articles manufactured under their designs to be submitted for awarding of the Quality Mark.

The research confirmed that the introduction of the KS UKP is a strong sociopsychological factor encouraging the labor activeness of the workers and improving labor quality. The KS UKP is applicable at any enterprise, the struggle for high quality involves all elements and makes it possible to definitely assess the quality level. The system not only materially interests the workers, but also encourages them morally,

since in introducing it each executor has a heightened feeling of personal responsibility for the results of labor and the effect of such factors as professional pride and worker honor is strengthened. The results of the study confirm this conclusion (see Table 2).

Table 2

Perception of KS UKP by Workers, % of Total

Worker replies to question "How do you perceive the KS UKP?"	As Average for Enterprise	First Enterprise	Second Enterprise	Third Enterprise	Fourth Enterprise
Primarily as a material incentive system	13.7	11.8	19.5	13.6	12.3
Primarily as confidence and a system of moral incentive	36.6	38.9	37.4	28.5	38.7
As a moral and material incentive combined	36.7	39.6	28.2	31.9	41.2
Difficulty in answering	12.5	5.5	12.7	23.1	7.8
No answer	1.5	4.2	2.2	2.9	--

Of particular interest is the workers' view of the various types of material and moral incentives. The replies of 1,200 workers of various ages to the questionnaire question "What type of incentive do you prefer for high-quality labor?" are shown in Table 3. The obtained data show the need of combining moral and material incentives and to differentiate these depending upon the age of the workers. Among people the impression is often created that they receive bonuses not for the quality of the work, but rather for social activeness, discipline and other indicators. Hence the fact that 30 percent of the persons questioned could not name their achievements in improving product quality or explain why they received a bonus.

We have long known the importance which correctly setting the minimal amount of the monthly bonus has in improving product quality with the existing wage level. Around 70 percent of the persons questioned consider this minimum to be 10-15 rubles. A bonus up to 10 rubles, as a majority of the workers feels, does not provide an incentive.

The research has convincingly shown the need to work out a special regulation at the enterprises for paying bonuses for the manufacturing of high-quality products. Where such regulations have been worked out, the workers understand everything in the KS UKP and vice versa.

Table 3

Worker Opinion of Various Types of Moral and Material Incentives, % of Total

Type of Incentive	For Total Number of Persons Questioned	Under 25	From 26 to 40	41 Years and Older
Monetary bonus	27	30	33	25
Free tourist trips, trips to sanitoriums and vacation homes	25	35	24	23
Commendation with entry in labor booklet	11	11	13	12
Putting up on enterprise honor board	5	5	5	7
Awarding of title "Best in Profession"	6	5	7	11
Promotion	9	3	10	9
Valuable gift	12	8	4	4
Announcement on pages of newspaper or radio story	5	3	4	9

In introducing the KS UKP, the basic accent should be put on the harmonious use of the means of incentive, since they improve the work results in 9 cases out of 10 while a reprimand in 8 cases out of 10 does not have a noticeable impact on the worker's conduct. At the same time, many executives still underestimate this as well as the psychological linkage between the quality of labor, its results, the executive's evaluation and the executive's interest in the individual subordinate.

It was also noticed that the effectiveness of the KS UKP can be reduced because the collectives producing a high quality product encounter poor work of urban transport, poor quality services in stores, dining rooms and so forth. The psychological attitude to producing high quality products also drops when the collective's work is impeded by cooperating enterprises. The sociopsychological factors--and the workers questioned mentioned this--would operate more effectively in introducing the product quality control system on the level of the rayon, city and sector as well as by creating an Unified State-Wide Quality Control System.

10272
CSO: 1820/1

PROBLEMS OF, ALTERNATIVES TO, ASSEMBLY LINES EXPLORED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 41-49

[Article by I. I. Prober, production chief of the Biryusa refrigerators in Krasnoyarsk: "Where the Conveyor is Going"]

[Text] The Conveyor Poses Problems

Many problems--social, economic, organizational and technical--are related to the conveyor. Here questions are encountered of production efficiency, raising the attractiveness of labor and improving working conditions. The conveyor is a complex phenomenon in production. It dictates a rigid pace, it creates simplicity and an obviousness of management decisions and has a number of advantages. Hence, it is very enticing to employ it more widely and to more completely break up the production process. However, certain dangers also loom up here.

Time studies conducted on the conveyors of our enterprise have disclosed fluctuations in the load factor for workers performing various moves on one conveyor from 30 to 90 percent. Analysis showed that if all the conveyor workers were evenly loaded by even 80 percent, here it would be possible to free around 20 percent of all the employees. The varying intensity of the moves is a consequence of the complexity of their composition, the organization of the work areas, the specific conditions in delivery, preassembly and breaking up of the moves as well as the complicating of accounting and job norming. The production placement and norming of the operations and moves are not coordinated also because different enterprise services are concerned with this work.

With flow-through conveyor methods, the labor of the last worker depends closely upon the labor of the previous one. For this reason, the actual rhythm of the conveyor is determined by the weakest, least skilled worker. It is actually impossible to utilize the individual capabilities of each person. Hence, wage leveling and a loss of the incentive role of wages. The competitiveness between the workers of one conveyor is not concrete and is ineffective. The pace imposed requires the synchronizing of actions by all the conveyor workers. But if from 30 to 50 persons are employed on a conveyor, it is extremely difficult to achieve a strict synchronization. Local breaks in the pace become a scourge of production. The assembly pace is reduced for covering possible unforeseen interruptions and labor productivity declines. At the same time, if there were intermove and interoperation process stocks, then the workers themselves

would set the required pace and unforeseen stops (emergency repair of equipment, fittings, natural requirements and so forth) could be compensated from these stocks. This is one problem.

Another problem (in investigating the example of our production) is to produce different models of refrigerators under the conditions of a saturated market. With two production lines it is possible to produce three and more models by two methods. The first method is to produce two models over a certain calendar period (month or quarter), and then the other models in the following period. The given method is unrealistic for in order to follow it, it would be essential to have the specialized equipment and supplies for the given model for the entire program. A good deal of space would be used unproductively. The equipment and supplies for models to be produced in the subsequent calendar period would lie idle. At the moment of shifting from one model to another, the general stock warehouses inevitably would be taken up with supply remnants (due to planning errors, failures to meet the quotas in the last days, the remaining supplies which on the last days prior to the conversion are subject to reworking and correcting).

The second method is to simultaneously put all models into production. In this instance, production space and expenditures on equipment and production supplies are saved. It is possible to have the separate output of small batches several times during a shift and to assemble all models in succession.

In both instances with flow-through conveyor production, there must be rigid synchronization of all the transport conveyors which deliver the parts, the presence of stock warehouses and the maintaining of at least the calculated amount of production and emergency supplies. In our nation, only comparatively recently did the L'vov Conveyor Construction Association begin producing transport conveyors with load addressing. The cultural and household appliance industry basically receives flow-through conveyors. It is rather difficult to synchronize the operation of such conveyors and the organizing of the production process is not so simple and obvious.

The production positioning of personnel on the conveyor envisages a strictly set number of production workers. At times, the lack of one becomes the reason for shutting down the conveyor. For ensuring the set pace, production is forced to maintain a larger number of production workers than is envisaged by the production placement, to have substitutes and clearly observe the precisely calculated day-off schedule. Since it is virtually impossible to envisage all possible no-shows by the workers on each conveyor, the line leaders are systematically forced to shift workers from one spot to another and from one conveyor to another. With the brigade form of organizing labor, such shifts create wage difficulties. The contribution of a new worker to the results of the brigade's labor is naturally less than the contribution of the permanent workers in this brigade and also less than he might make at his own permanent job. But his wages cannot depend directly upon the results. In order that the wages of a worker who is to be shifted about not decline and at the same time be sufficiently encouraging, it is essential to introduce special wage coefficients and this complicates the norming and organization of the production process.

In conveyor production, the product volume is not linearly dependent upon the number of production workers. The production placement of the workers is calculated for a certain output program and a change in the program involves a change in placement. The labor intensiveness of one production set becomes a variable amount which depends

upon the size of the program. Since the production placements are rather conservative, in line with a change in the program and the range of produced articles, a change in them is technologically difficult and involves the questions of organizing the work areas, the delivery of supplies and so forth. These are two other problems.

Furthermore, the set required rhythm necessitates the flawless operation of the equipment and production fittings. For carrying out the given condition, great work must be done in forecasting repair and preventive maintenance and there must be great efficiency in eliminating emergency breakdowns. This can be achieved only by large repair services which are well equipped and have supplies of spare parts and semifinished products.

Finally, as the production process is broken up into elementary movements, the meaningful aspect of labor is more and more lost and it becomes less understandable and uncreative. Labor is reduced to repetitive monotonous movements at a pace imposed externally on the worker by the conveyor's speed.

An analysis of personnel turnover in our production has disclosed the greatest migration primarily among conveyor workers who have worked on the job for less than a year. Educated persons, in coming into production, have begun to make demands upon the meaningfulness of labor. The bad effect of conveyor methods on the workers complicates the social atmosphere in the sections, it worsens product quality and does not create favorable conditions for the individual abilities of a person.

In mass flow production using a system of production and transport conveyors, the change in the content of labor occurs only along the horizontal as a result of a redistribution of functions in the "man-machine" system. Because of the mechanization and automation of production, there is a qualitative change in the executor function. At the same time, the creative possibilities of work are characterized not only by what must be done, but also by how it is to be done. The limits of this "how" primarily influence refrigerator quality and in our plant this has been taken into account in improving the organization of labor.

The continuity of conveyor assembly can be achieved only with supply stocks for each production brigade. Production of the Biryusa refrigerators does not have any large stocks due to the lack of production area. Under the conditions of the flow-through conveyor production, a break in rhythm at the initial stages of the production process is painfully felt in the results of main assembly.

Historically, production has developed from autonomous production through the evermore detailed division of labor to the conveyor. The elaboration of production processes which would integrate the best elements of the designated polar technologies would meet the needs of today. It would be a good thing to completely abandon production conveyors, leaving only their transport and auxiliary functions. The abandoning of heavy, monotonous conveyor work means an enrichment of labor. The worker performs more diverse tasks, he independently adjusts the pace of the assembly process, he receives more extensive information and is remunerated for the quantity and quality of labor. His labor is aimed at the end product. An opportunity is created to disclose the individual abilities of a person, to improve product quality and to save labor resources.

At a number of foreign firms, attempts have been made to abandon conveyor production. However, the high cost of reconstruction, the additional outlays on equipment and production fittings and the necessity of increasing the production areas have led to a situation where the creation of the new organizational forms of labor is still in the experimental stage. Attention should be paid to the experiment of the Swedish Volvo firm in Kalmar, where motor vehicles are assembled by autonomous brigades on movable dollies and the work of the workers is oriented at the end product. In our national economy, there are also examples of the complete or partial abandoning of conveyor production. [1]

Integrated Production Schemes to Replace the Conveyor

The integrated production schemes employed in our production have made it possible to save labor and carry out the task of enriching it. Principles have been set down for organizing integrated production schemes and the range of tasks to be carried out by introducing:

1) The replacing of sequential labor processes on the conveyor lines by parallel group work areas;

2) Increasing the meaningfulness of labor by sharply increasing the number of moves performed by one worker;

3) The fuller utilization of working time due to the subjective abilities of the worker and improving the use of aggregate working time;

4) Increasing the maneuverability of production in changing the plan's structure;

5) Production mobility in developing new models;

6) Developing the basis of competitiveness between the collectives and workers;

7) Mitigating the rigidity of the compulsory pace;

8) Partial combining of functions for basic and auxiliary workers;

9) Improving relations between workers.

We have adopted a new form for organizing the labor process. The conveyor line for assembling refrigerator doors has been reconstructed. The production process has been provided with 11 moves performed in accord with the production placement of the 11 basic workers. The average employment factor of the workers (the ratio of normed piece time to that given for the production placement) equaled 0.7. We worked for an organization of the labor process whereby each worker would perform a maximum number of moves and for this the moves were grouped into a minimum number of operations. The grouping was carried out according to the production features considering the employment factor, endeavoring to make the operations equally labor

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1 For more detail, see EKO, No 1, 1979, pp 105-126; No 1, 1980, pp 40-50; No 4, 1980, pp 172-184.

intensive. It is also essential to consider such production constraints as the required sequence of operations, the specific features of the production process and so forth. For the given production process, the optimum number of operations and hence the optimum number of workers for the given group work area equaled 3. By the rational grouping of the production moves at the first stage, we have endeavored to maximally utilize the reserves of aggregate working time for the entire brigade.

At present, five production teams of three persons each perform the work which previously was carried out by two 11-man brigades. The first shift employs three teams and the second has two. The backlogs of assemblies manufactured on the first shift for the second shift of main assembly are kept in the supply warehouses. Each production team has its own stamp and this actually helps to improve product quality. Although the optimum number of workers is three persons per team, the range of operations at each group work area can be performed by two and even by one person. Certainly the labor will be less effective, since the workers must perform additional procedures and movements.

Such a failing of conveyor production as the shutting down of the conveyor because of the failure of workers to appear, with the integrated production schemes, is eliminated by the parallel work of the production teams and the possibility of work with an incomplete number of team members.

All the production teams of one section are united into a brigade. The workers are paid using labor participation coefficients. The daily count of manufactured product is made indirectly by the turning out of a designated number of a certain set going for assembly. The workers of the production team themselves plan and organize their labor process. In the integrated production schemes, the workers are protected against the effect of the conveyor-set mechanical rhythm. Although the continuity of the production process is set by the pace of the transport conveyor, the workers do not put on assembled units continuously, but rather in batches as the assemblies pile up. The rhythmicalness of the process is not reduced due to the local accumulations at each group work area. Production areas around the group work areas are used for local accumulation and this largely eliminates the problem of supply stocks and creates prerequisites for the simultaneous production of several product models.

The new work methods have not required great capital investments and the reorganization is possible in ongoing production without halting it or without reducing the total product output. For us the technical preparations for reorganizing the labor processes were carried out by the production preparation services and by the auxiliary workers. For this reason, the expenditures on everything were comparatively small. The group work areas away from the basic production process were set up and equipped ahead of time, while the routes of the overhead conveyors were reconstructed during nonworking hours and days off. The work was carried out using element schedules which provided a gradual transition to the new working methods.

Along with the technical preparations, great explanatory work was carried out in the collectives of the sections to be reconstructed. The foremen and production engineers told the workers of the contents of the new methods, they described the prospects for increased labor productivity and wages and mentioned the greater meaningfulness of labor. They showed an interest in the opinion of each worker on the advisability and size of the production teams. In the designing stage, great attention was given

to work convenience, to the rational placement of equipment and the proper equipping. The workers were given an opportunity themselves to make up the production teams considering mutual likes and dislikes. As a result, the introduction of the integrated production schemes in the sections was carried out without conflicts.

The integrated production schemes are also attractive in the fact that they do not require an overall reconstruction of production, they are adaptive and in them the dependence of the labor of the subsequent worker upon the results of the previous one is significantly reduced. Reserves are also established for increasing labor productivity. The new production schemes are either completely free of the negative aspects of the flow-through conveyor or significantly mitigate them.

The introduction of the new production methods requires changes in the methods of operational planning. Due to the production constraints, batches of parts are put into production discretely in some areas and continuously at others. Flexible operational planning should provide for the filling of the local interoperation and intermove stocks and a calculated piece-by-piece replenishment of the shop stock supplies. The classic task of operational calendar planning is supplemented and adapted to the conditions of the new production methods. With multiple model output with a limited number of production lines, operational planning to a significant degree forecasts and eliminates disturbances in the production process.

The attractiveness of labor depends not only upon its content, but also to a significant degree upon how the professional advancements of a worker are forecast. A young person in coming to work at a plant is shown a picture of his professional growth over a certain period of time from a production worker to a highly skilled tool maker. A system of mutual obligations is created between the administration and the worker. The system of vocational growth creates a basis for the growth of skill and, as a consequence, has a positive impact upon the output of high quality products. This unquestionably helps to develop an interest in labor. The introduction of a system of professional advancement is our primary task. A regulation on professional advancement has been worked out. It establishes the types of advancement and the demands made on the candidates, the procedure for their selection and accounting. It also describes the methods of professional advancement and gives an example of a worker's professional advancement card.

For a person coming to work at a plant, it makes a great difference where he will work. Obviously, a worker in a clean, bright and warm room will work more productively and his product will be of higher quality. For example, using our own forces we have carried out extensive work to develop a strong set of ventilating systems. At present, in production there are no areas where the gas pollution level exceeds the standard. The bringing of the illumination level in the production areas up to 300 luxes has also helped to increase labor efficiency.

The improved conditions in the work areas have contributed to the reasonable and rational use of the enormous potential found in man and is expressed in the growth of labor productivity, improved product quality, reduced personnel turnover and the elimination of production losses.

10272
CSO: 1820/1

ON MAKING LABOR MORE ATTRACTIVE

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[Article by T. I. Saksakulm, senior science associate at the Scientific Research Institute for Economics and Planning Under the Estonian Gosplan in Tallinn: "How to Make Labor More Attractive"]

[Text] Technical progress is contradictory: it makes labor physically easier, but at the same time makes it more boring and monotonous. Frequently, labor becomes unattractive on a conveyor. However, practice shows the possibilities of increasing the attractiveness of labor if the conveyor cannot be eliminated. According to data of conducted research, for example, more than 60 percent of the workers who perform over five operations view their job as interesting. Among those who perform from two to five operations, 44 percent were interested in their job and only 33 percent of the workers who perform one operation consider their job interesting.

In order to reduce the feeling of monotony, the rotating, broadening and enrichment of labor are employed. The rotating of labor means the giving up of the permanent assignment of a worker to one place on a belt conveyor. After a certain period of time (from several hours to several weeks), the worker moves to another work area where he will perform different operations. After moving to a third, fourth and subsequent place, the job comes full circle and the worker returns to the initial operation. As a result of rotating, labor becomes more diverse and meaningful.

A distinction is made between horizontal and vertical broadening of labor. The horizontal is aimed at the same goal as rotating, that is, to diversify the job. The sole difference is that in the former instance the number of assignments is increased and the worker does not move from one place to another. A vertical broadening means the supplementing of the executor function by other ones such as calculation, inspection, control or repair. The worker is given the right to determine how to carry out the assignment, how to allocate time and so forth. With a vertical broadening, the worker has an increased feeling of responsibility and independence. The need for autonomy and self-expression is also satisfied.

The most radical means for improving the content of labor is to enrich it, that is, to incorporate in labor activities such elements which ensure the so-called inner motivation for labor. Among the basic conditions of inner motivation one might put: the meaningfulness of labor; a feeling of personal responsibility for carrying out labor assignments; awareness of the results of one's labor.

The meaningfulness of labor is determined by the diversity of abilities, by the integrity and social importance of the labor assignments. A feeling of personal responsibility predetermines the right to plan and organize one's own labor and within certain limits to make it independent of others. The fulfilling of the third condition for inner motivation makes it possible for the workers to compare the labor contribution and its corresponding remuneration. For example, the psychological effect of bonuses is noticeably increased if the workers know for what results they are receiving bonuses.

The principles of enriching labor indicate how a given job must be changed so as to strengthen its motivating features and at the same time increase motivation potential. These principles determine the methods of forming labor and these individually influence one or several motivating labor features.

The first principle is: the forming of a natural and integrated structure for labor activity. For example, in an enterprise's office the work (letters, reports and so forth) can be allocated differently between the employees, for example: quite randomly so that any work may be given to any employee; or a typist types out materials needed only for one department or instead of typing a certain portion of a long job performs the entire job. Only in the second instance is it a question of a whole job assignment and the executor knows the area of his or her work precisely.

The second principle is to combine the assignments. The combining of individual job procedures has a positive influence at least on two motivating features: on the diversity of skills and on the integrity of the assignments. After the reorganizing of conveyor labor, the workers should not merely carry out a certain operation, but rather manufacture an entire unit or check it out on a testing stand. As a result of unification, sometimes too large a "piece" can be formed for one worker. In this instance, it is advisable to turn over the assignment to a brigade the members of which allocate the work amongst themselves.

The third principle is the establishing of relations with the consumer. In breaking up the job, a worker loses contact with the consumer of his product or service. The reestablishing of contact provides an opportunity to have a positive influence on three motivating job features. In the first place, feedback is strengthened since the consumer's evaluation of the work done becomes known. Secondly, the need for contacts increases the number of necessary skills (the ability to establish contact). Thirdly, the independence of the worker in contacts with the client tells positively on autonomy. The establishing of contacts can be viewed as three-leveled: initially it is essential to determine the consumer, then establish contact; finally, the consumer must learn how to assess (measure), if he is unable to do this, the quality of the article or the service rendered to him.

The fourth principle is a vertical load. The given principle draws attention to the qualitative complementing of labor by new functions, primarily planning and technical inspection:

1) The worker within certain limits (on the basis of a rotating work schedule) himself determines when he is to arrive on the job, when he is to have a dinner or other break and when he will end the shift;

2) The worker himself is responsible and determines how one or another job is to be performed and what methods or means are to be employed;

3) The worker performs several operations (the maintenance of the equipment, repairs and so forth), without turning to the leadership;

4) The worker himself inspects the quality of his work, he provides advice and aid to less experienced colleagues and so forth.

The fifth principle is the strengthening of feedback. At times, the workers do not know whether their work has become better, worse or remained on the previous level. Although the work results can be announced in different ways, the best version is considered to be information received on the job. Such feedback is the most effective, it is organically linked to the activities and excludes the sometimes difficult need for contact. In the hot stamping division of the Moscow Motor Vehicle Plant imeni I. A. Likhachev, every 30-60 minutes the workers are informed on the number of finished products (motor vehicle pistons). It is considered that such direct information has made a major contribution to increasing labor productivity as it virtually doubled during the 4 months after the introduction of the innovation.

The principles of enriching labor are far from encompassing all the opportunities for reorganizing labor in accord with the psychological properties and needs of man. The aim of this is to make work more interesting and meaningful and to provide an opportunity to improve knowledge and abilities and to advance up the job ladder. All of this entails numerous positive consequences.

10272
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INFRASTRUCTURE PROBLEMS RETARD DEVELOPMENT OF TUNGSTEN DEPOSITS

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[Article by I. S. Shepeta, chief engineer of the mining and processing combine in Maritime Kray: "Development Lessons"]

[Text] We Found the Pearl

The Far Eastern Sikhote-Alin Range is famous for its rich nonferrous metal deposits of lead, zinc, tin and so forth. These have become the basis for the organizing of large mining and processing combines (GOK). Although the intensive development of the minerals started relatively recently, in the middle of the 1950's, it has already been marked by a notable contribution by the Far Easterners to the mining of polymetallic ores. Geologists assumed that tungsten should also be present in this area and traces of it were noticed in undeveloped and inaccessible areas of the Maritime Kray, but for a long time a deposit could not be found. Tungsten in the form of pieces of scheelite was discovered during the days when the famous Vostoks were flying in space and from these came the names of the streams Vostok-1 and Vostok-2, the deposits and the settlement of Vostok.

All the data showed that the ore was unusually rich. Over a period of 2 years, the deposit was explored and put into operation and a group of geologists was awarded the USSR Lenin Prize. In order to accelerate the exploitation of the deposit which was a true pearl, the designing of the installations for the future Primorskiy GOK commenced even before the establishing of the reserves. The start on the combine was set for 1972 with a construction period of 5 years, and for this extensive construction and social facilities had to be developed.

We Split the Pearl into Parts

Unfortunately, the innovative ideas ended with this and traditional development of the deposit started with construction being drawn out 3- or 4-fold longer than in the plan. Again, the industrial facilities were built first while the construction of housing and cultural-service facilities was deferred.

The then Glavvol'fram [Main Administration for the Tungsten-Molybdenum, Fluorspar and Mercury-Antimony Industry] of the Mintsvetmet [Ministry of Nonferrous Metallurgy], regardless of repeated arguments by the leaders of the combine under construction,

demanded the quick production of ore, without wanting to think not only about the social, but even the production infrastructure. Thus, in April 1969, the GOK dispatched the first batch of rich ore by helicopter for producing concentrate at other enterprises. The ore caused a good deal of trouble due to the high content of harmful impurities in the form of sulfur, arsenic and phospherous the amount of which exceeded their content in the traditional ores by many-fold and required the development of a special method for eliminating them. The rush for an immediate result had lamentable effects. Although the deposit included five basic ore types, only the richest and most easily processed variety was studied and the planned technical and economic indicators were calculated from this.

Before the combine was officially open, it had mined 1.2 of the volume of the annual planned ore output. But more than one-half of the extracted amount with a poor and hard-to-process tungsten composition was transported to the dump. For obtaining an industrial product, only ore was used with a tungsten content that was 2-fold higher than the figures for the reserves.

Just as a broken pearl is valueless, so in the given instance the 9 years of selective mining of the richest ore did not produce a profit. Moreover, to a definite degree such work diverted scarce human resources from construction.

In Accelerating, We Slow Down

Construction picked up its pace, however this was 2-fold less than the necessary.... Glavvol'fram tried to accelerate work by first excluding a number of projects from the plans and secondly by holding up the already curtailed portion of nonindustrial construction, basically housing.

From the plans they excluded the facilities of the energy, repair, transport and warehousing systems, a sports facility and several multistory buildings. This reduced the capital investments for the first stage of the GOK by almost 30 percent, but created enormous difficulties for the combine which had been put into operation and caused significant losses. For example, the excluding of a 110-kilowatt power transmission line with a substation led to the need of producing electric power at a departmental diesel power plant and this produced 1.3 million rubles of losses. The lack of a garage and facilities for repairing and servicing motor vehicles in the winter time at a temperature down to -45° led to the premature failure of the vehicles and to great working time losses on warming them and additional repairs. A significant shortage of warehousing caused damage to materials and spare parts.

The short-sighted policy in nonindustrial construction, particularly in building housing, had very bad consequences. According to the plans, the average share of capital investments for these purposes was to be 22 percent of the total volume, but in fact in 1967-1970 the share was 1.8 percent, 14 percent in 1971-1975 and 11.8 percent in 1976-1977. Over the entire period it was 7.3 percent. Up to 1970, no housing was completed and in 1971-1975 and 1976-1977, the figures were 16 and 34 percent of the planned.

By the time the basic production facilities at the combine were in operation, it had just one-half of the planned housing. By this time the volume even in the design stage had been reduced by almost 40 percent. The construction workers had also not

completed the House of Culture, the trade center, a children's day-care center for 280 places, a drugstore, a hospital building, an automatic telephone exchange for 400 telephones and a food supply warehouse. No construction on the sports installation had started.

Thus, the priority given to basic production and the later start on housing construction put back the completion of the combine by approximately 5-7 years.

Poorly Laid Out—Hard to Sew Up

In the meanwhile, Glavvol'fram was broken up and the combine under construction became part of VPO Soyuzpolimetall [All-Union Production Association for Polymetallic Ores]. The reorganization of management, on the one hand, and the scarcity of tungsten in the nation on the other, helped the VPO and the GOK find a convenient formula for eliminating the designated disproportions of the combine. Even before the completion of the first stage of the combine, a decision was adopted to design and build a second stage, increasing ore output and processing by 40 percent.

If everything had been built that was planned for the completion of the first stage, it would have required few capital investments for expanding production in adding on to the processing mill and building several residential buildings for the collective. These amounted to 25 percent of the first stage. But now the design institute was forced to conscientiously reestablish in the plans virtually everything that had been stricken from the title lists or had not been built in the first stage. Immediately the investments of the second stage were increased and they amounted to 80 percent of the first stage. This of course caused arguments by the Gosplan which held up the approval of the technical plans for 2 years and cut back on certain things. Now, after the completion of the second stage, the GOK remains without a training center and engineer [utility] building and without any rooms for the engineers and technical personnel of the shops, for training the workers and carrying out sociopolitical and indoctrinational work in the shops.

Thus, the appearance has been created of poorer economic indicators for the second stage in comparison with the first. Actually with the normal carrying out of the plans for the first stage, the 40 percent increase in tungsten output after the completion of the second stage would clearly have shown the advantages of expanding the combine. But even under the existing conditions, the indicators of the second stage will be rather high due to the value of the ore. Under the conditions of the inevitably arising contradictions of an incomplete and operating enterprise, the necessity has arisen of altering the policy for the combine's development.

It has long been known that the more poorly the cloth is laid out, the harder it is to sew. It is lamentable that the losses are borne not by those who have laid and relaid the plans, but rather by the client.

Social Services Determine Everything

While yesterday the future operators of the combine along with the construction workers were hard at work completing the first stage, at present we must change the direction of work, that is, focus the production workers of the GOK (or, as is usually said, the production engineers) on the planned development of production capacity and the

obtaining of high-grade tungsten concentrate. It was precisely a question of attuning as a majority of the workers was young, inexperienced and untried. They had to be unified into a single collective.

At the same time, many of them were family persons, they had small children and came to the settlement in the hope of obtaining an interesting job, good housing and a place for their children in children's institutions. Even after the completion of the first stage, around 250 families lived in barracks and primitive wooden housing, more than 100 families lived in dormitories and almost the same number in modern housing, although there were two or three families per apartment. Scores of workers came daily to the director and the chairman of the trade union committee with questions about housing and children's institutions.

Stores in the barracks and a club in an unmodified wooden building of the construction base could not hold or satisfy all those who wished to come. Certainly the conception had been of a good settlement among the evergreen tayga, on the shore of a clear river in which you could catch local fish. The apartments were to have hot and cold water, electric stoves....

"If you want to change policy, then change people"--this management truth was also right here. Thus it happened that almost immediately after the first stage was complete they replaced the director and the chief engineer, the party committee secretary and the trade union chairman, a number of other economic leaders at the combine as well as the chief and chief engineer of the construction administration. The new leadership of the combine and construction administration set the following development policy: in capital construction, priority was to be given to the nonindustrial projects; in creating the collective there was to be a sharp strengthening of indoctrination; in basic production there was to be an ongoing improvement in the technical and economic indicators based on ties with science.

The carrying out of the designated measures was aided by a single client in the form of the combine and a united party organization which brought together the client, the five contractors and all other organizations in the settlement. The unified party committee meant a unified direction in capital construction and systematic fruitful work by the project's party staff which often mobilized additional forces and means for construction and promptly anticipated possible hitches for the contractor and the client.

Construction was accelerated on the trade center, the second children's day-care center for 280 places and the House of Culture. But still there were not enough children's institutions. In line with this, a portion of an apartment building was converted to a nursery. For accelerating the completion of housing, the GOK frequently provided help to the construction workers in the form of personnel, transport, earthmoving and loading equipment, although it itself was in a difficult situation at times. Moreover, the future residents were used for finishing and other jobs. Ordinarily a majority of the persons impatiently waiting for a modern apartment were more than willing to respond to the appeal for help.

Due to these measures, for 3 years running, the plan for completing housing has been fulfilled by 150 percent. The acuteness of the housing problem has begun to decline. In 1980, we completed the demolition of all barracks and families which lived in multifamily apartments were moved into their own ones.

The intensification and unity of organizational and indoctrinational work made it possible to sharply reduce personnel turnover and the violations of social and labor discipline. The questions of improving the technical and economic indicators of production began to be successfully solved. Greater attention was paid to the combine's socioeconomic development. In 1983, we plan to complete the last residential buildings under the plans for the second stage and the settlement will be fully completed.

Of course, the plans are not a dogma and in a number of instances require adjustment. The figures for the need for nurseries and schools were incorrect for the number of children in such settlements is high. Nor were the figures right for the demand for housing, for ancillary services which are not required for production and everyday life as well as organizations which are not part of the plans begin to arise in such settlements. The figures for the use of the planned versions of large panel housing were wrong for because of the low winter temperature their walls freeze and the roofs leak constantly because of the thawing of snow.

There are also mistakes in the plans for the GOK. In basic production they planned little productive loading and transport mechanisms and automation is lacking. They have still not resolved the problem of organizing construction facilities for the northern regions of the Maritime Area and for this reason a majority of the concrete products, sand and crushed rock are shipped in from the south over hundreds of kilometers although they could be produced on the spot.

The soviet, together with the settlement aktiv worked out a plan for the sociocultural development of the settlement in 1981-1985. It envisages significant additions to the plans, particularly in the area of public works, consumer services, the creation of training facilities, in the building of housing, sports facilities, a school and nursery and a food supply for the settlement. The material basis for this plan is the technical plans for the second stage, the combine's development fund, the independent initiative of the enterprises and the inhabitants' efforts.

Positive changes have already come about in the training of personnel and in organizing a food supply. A procedural council has been set up under the joint party committee for directing general educational, economic and political studies. A majority of the young workers have a secondary education, but in 1978, there still were around 250 persons under the age of 30 who did not have it. For this reason, an evening school for working youth was organized. Over the 3 years it has been completed by 90 young workers and the 11th Five-Year Plan envisages a secondary education for all the youth of the GOK and the settlement.

In order to improve food supply for the workers, the combine built a pig farm for 300 animals. There is no land for preparing feed close to the settlement and for this reason we cooperate with one of the region's sovkhozes in planting and preparing feed and we provide technical aid to the sovkhoz as well as human resources.

For individual orchards and gardens the executive committee of the settlement soviet with the aid of the combine has organized the preparing of a 50-hectare plot of land. There were many persons who wanted to engage in this and at present an ever-increasing share of vegetables is beginning to be supplied by the private farms. It seems to me that to a definite degree the truck farming has taken up a portion of the inhabitants' free time and reduced the cases of drunkenness in the settlement.

In a word, the active resolving of sociocultural problems has created a firm basis not only for promptly developing the first stage of the GOK, but also for its future development.

To Promptly Establish the Future Prospects

The combine sees its future in subsequently emerging in one of the leading places in the nation for producing tungsten concentrate. The raw material reserves for such a task to a significant degree have been established. But it is essential to accelerate their development. The figures show that considering the new wholesale prices for tungsten concentrates on 1 January 1982, it will be profitable to exploit ores with a lower tungsten content than at Vostok-2. But even in these ores, its concentration is significantly higher than the sector average.

In order to avoid serious disproportions, it is essential to simultaneously mine and process the rich and poor ores of the region. The future of the region which is also rich in polymetallic and tin ores of the composite type depends upon how rationally and comprehensively the deposits will be worked.

The combine has proposed that in the next few years, the Primgeologiya [Maritime Geology] Association will turn over the production tests from two or three such composite deposits for working out the concentration methods. These will become the fourth stage of the combine. The third stage of the combine has been planned and is awaiting financing.

In our kray, there are four combines of the Mintsvetmet. They are unacceptably isolated in economic terms. Each of them has organized its own repair facilities and the operation of these costs 5-10-fold more than if a single organization had been set up. This problem also awaits its resolution.

Designing, financing and construction in undeveloped or litte-developed areas should be carried out by a single client. In order to avoid a departmental approach, it is advisable that the assignment for designing undergo an expert evaluation in an interdepartmental Gosplan commission. This could provide a unified construction base, cooperation among related and neighboring enterprises and a comprehensive solution to the infrastructure problems and the social-domestic questions.

[Editor's Note.] The situation described in the article by the chief engineer of the maritime GOK, I. S. Shepeta, is rather typical for the development of new enterprises. It could have happened at any plant, combine, mine, in any region. But in an uninhabited area, where nothing yet exists, the negative consequences of an uneven approach to designing and construction and a desire for an immediate effect to the detriment of the long run are felt particularly acutely. A lag in the development of the social and production infrastructure gives rise to enormous difficulties in making up the labor collective and in reaching design capacity.

One must give proper due to the courage and energy of the leaders and collectives of the maritime GOK. The first party of specialists was set down by helicopter in the literal sense of the word on the bare tayga. Under difficult conditions, far from inhabited areas, the miners with enormous enthusiasm and love built their new settlement and endeavored that its inhabitants would not feel the primitiveness

and there would not be the temporary housing and the psychology of instability engendered by this. One must see for oneself how each design is carefully discussed for the nursery or club, and how the people willingly devote their Saturdays to construction and public works in order to assess the general atmosphere of involvement in creating a stable labor collective.

Ultimately at the maritime GOK, as at other new enterprises, they overcome the difficulties and consequences of unbalanced construction, but this is done at a price of additional outlays and a delay in putting new capacity into operation. This is a rather dear price.

10272
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DEVELOPMENT OF RESOURCES, INDUSTRY IN EAST SIBERIA, TRANSBAYKAL

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 61-74

[Article by G. M. Vol'deyt, deputy chief engineer of the Road Construction Administration of Bratskgesstroy of the USSR Ministry of Power and Electrification in Bratsk: "Yet Again on the Lessons of Bratsk and the Concentration of Forces in Developing New Territories"]

[Text] A Single Boss is Essential

A crucial condition for carrying out any construction programs according to a plan is the concentrating of efforts on transport, housing and service construction and the developing of a construction base. This does not provide an immediate return, but does make it possible in the most effective manner to obtain an end product in the form of electric power, aluminum, pulp and so forth.

Unfortunately, the construction of all the projects was financed by different clients and this caused all the negative aspects in the development of the construction organizations. This is an old and familiar ailment.

Its symptoms were clearly apparent in transport construction and in developing the production facilities for Bratskgesstroy [Bratsk GES Construction Administration].

The transport development of the Ust-Ilimsk area started with the building of the Bratsk--Ust-Ilimsk road some 247 km long across undeveloped tayga territory. The basic difficulty which determined the terminating date of construction was the lack of financing. Year after year the construction workers fulfilled the annual plan in the first 6 months, but during the second half of the year they worked on credit. For this reason alone traffic was opened only in the 5th year of construction and only in the 8th year was the road put into complete operation (with a normed construction period of 3 years).

The basic purpose of the Bratsk--Ust-Ilimsk road was to haul lumber to the Bratsk and Ust-Ilimsk lumber industry complexes [LPK]. Freight was also hauled over it for the construction of the Ust-Ilimsk GES and the LPK. Bratskgesstroy repeatedly turned to the USSR Minlesprom [Ministry of Timber, Pulp and Paper and Wood Processing Industry] with specific proposals for joint construction of the road and the combining of this with the construction of the forestry enterprises along the route. In this instance

there would be no need for temporary settlements and most importantly, the development of capacity for the lumbering facilities of the Bratsk and Ust-Ilimsk LPK would be accelerated. The forestry enterprises located in the area of the Ust-Ilimsk Reservoir could promptly clear the area to be flooded of timber. But the USSR Minlesprom at first rejected these proposals.

By the time that it did begin participating in the construction of the road and the forestry enterprises, the basic construction collective had left the road's route and Bratskgesstroy was forced to organize new collectives. As a result, today the forestry enterprises are still not complete and reconstruction of the road has not been completed. Unfortunately, conclusions were not drawn from this unseemly history. The Minenergo [Ministry of Power and Electrification] has been building the extension of the Bratsk--Ust-Ilimsk road for 5 years in sad isolation and inevitably lumber will be hauled over this road to the area of the LPK.

The lack of a single client has also told negatively upon the level of designing transport construction. The design institutes, in carrying out the requests of the clients, fulfill only a portion of the tasks involved in transport construction. Such designing has led to great mistakes in organizing the transport development of the Bratsk and Ust-Ilimsk energy-industrial centers. Only recently have general transport plants appeared for Bratsk and Ust-Ilimsk. Tens of millions of rubles must be spent for carrying these out, but a majority of the money could be saved if there were prompt general transport plans.

Bratskgesstroy from the very outset has assumed full responsibility for the creation of the production base, the proportional resources of the departments and the functions of the client and the designer. The design office of Bratskgesstroy has 380 employees. The design collective celebrated its 25th anniversary in 1980 and has gained valuable experience in designing the most diverse projects for the production facilities of Eastern Siberian construction.

The presence of a single client and a single designer has made possible the establishing of a powerful construction industry for Bratskgesstroy, one of the largest in Siberia. But the unsteadiness of financing has led to disproportions in its development. In particular the mechanization bases have repair buildings that operate at 50 percent of capacity. At the Ust-Ilimsk site, the fulfilling of a number of items in the state plan has not been provided with crucial materials such as concrete, mortar and asphalt, due to the delay in creating production capacity.

Such examples are characteristic and reflect the general state of affairs during the first stage of development and this determines the development of capacity for construction organizations in the new development zones.

In our view, it would be correct if financing for the construction of the first development stage (transport, housing, service and the creation of a construction base) would be converted to credit extended to the territorial general contracting organization. Then the following procedure could be established. The Gosplan would set the 5-year calculated limit based on statistical data for credit for the TPK [territorial production complex] as a whole and the credit would be put up by the clients prior to the start of construction within the limits of their proportional participation. Of course, this is a general scheme and requires major additional studies. But, having introduced

it, we would solve the basic question of creating a single client who is fully responsible and interested in the rational utilization of the allocated funds.

The Organization of Construction on a Modern Level

The development of the TPK in Eastern Siberia in the development areas of the industrial belt such as the Angara-Yenisey, Middle Angara, Upper Lena and Northern Baykal is a component part of the Siberia Program which is being worked out. Scientists have advanced the slogan: "Technology of the 21st Century for the industrial development of the BAM [Baykal-Amur Mainline]. Against this background one can particularly see that sectorial construction science in our area has fallen greatly behind the needs of the gigantic construction projects.

It has developed historically that any large or small construction site should have a plan for organizing construction. This is enough for the developed territories. But it is not enough for Bratsk. We must have a plan for organizing construction for the entire Bratsk energy-industrial center. For the newly developed territories, it is essential to have plans for organizing construction for the entire region, the individual TPK, the energy-industrial centers, the construction industry enterprises, the cooperating construction bases of the TPK and the construction bases of the energy-industrial centers.

If the Siberia Program is the development strategy, the plans for organizing the construction of projects within the Siberia Program are the tactics. Strategy without tactics is dead. In Eastern Siberia it is essential to have a plan for organizing the development of the industrial belt of the Yenisey—Bratsk—Vitim. Such a major task is only within the power of a large design institute. In collaboration with the Institute for the Economics and Organization of Industrial Production under the Siberian Division of the USSR Academy of Sciences, it could ensure the elaboration of the plans for organizing work in developing the major energy-industrial centers, the TPK and the entire region of the industrial belt.

Assembly-Line Construction of the Energy-Industrial Centers

Hydropower in Eastern Siberia should be developed harmoniously along with the development of the lumber and lumber processing industries. It is essential to organize combined and assembly-line construction. The development of the energy-industrial centers can be started by the building of both the GES and the LPK. The TETs which are part of the LPK have surplus capacity and the LPK does not need electric power from the GES.

The choice of the construction sequence in the centers can vary: the LPK—GES; the first stage of the LPK—GES—the second stage of the LPK; GES—LPK. The first two versions for the construction sequence of the energy-industrial centers are most rational in establishing a single city and a single large construction base and ensure the early felling, hauling and processing of the timber in the flood zones of the reservoirs planned for the construction of the GES. At the same time, the experience of Bratsk and Ust-Ilimsk has shown that in beginning the development of the energy-industrial center with the construction of the GES, it is extremely hard to create one city and one construction base and it is completely impossible to ensure the prompt clearing of timber out of the flood zone.

The capacity of the forestry enterprises located in the areas of the reservoirs does not ensure the rapid clearing of the territory. In addition, the zones of their work do not cover, as a rule, the entire territory to be flooded. For guaranteeing the complete clearing of the forests, around the perimeter of the reservoirs being designed it is essential to build roads and forestry enterprises, that is, it is essential to start with the development of the timber source of the LPK being designed in the sites of the GES. If we start the development of the energy-industrial center with the GES, then we must plan the flooding of the forest. If we start with the LPK, then we can plan the complete clearing and processing of the timber.

The long-term specific program for assembly-line construction of energy-industrial centers means rapid construction, the introduction of all that is new, increased efficiency of construction and, ultimately, the constant completion of capacity.

But is it essential to speed up the construction of the GES and LPK in Eastern Siberia? We can observe a strange tendency in the planning and organization of construction for the large GES. The first unit of the Bratsk GES went into operation in the 7th year of construction, at the Ust-Ilimsk and Krasnodar in the 12th, at the Sayano-Shushenskaya in the 15th year while we plan to complete the first unit of the Boguchany GES during the 16th year of construction.

The major projects have been started virtually simultaneously: the Bratsk and Krasnoyarsk GES in 1955-1956, and the Ust-Ilimsk and Sayano-Shushcnekaya GES in 1963. From 1963 through 1967, construction was carried out simultaneously on four GES. All of this had led to an artificial drawing out of the construction times. With the sequential assembly-line construction of not more than three plants simultaneously, by reducing construction times, we could gain 5 years of additional operation of a large GES and this would ensure the generating of approximately 100 billion kilowatt hours of electric power.

Why is it essential to have accelerated construction of LPK in Eastern Siberia? The completion of production capacity for pulp is as follows: 2.2 million tons in the 8th Five-Year Plan, 2.1 million tons in the 9th, 0.9 million tons in the 10th, while in the llth there is to be an increase of 1.3-1.4-fold in capacity. The ensuring of a further increase has presently become more difficult. In the European USSR, the real raw material resources have been used up. A further increase in capacity for lumber processing necessitates the hauling of raw materials from the areas of the Urals and Siberia. Up to the end of the century, Western Siberia will be occupied with the questions of refining oil and gas and there cannot be a large increase in wood processing in the immediate future.

There remain Eastern Siberia and the Far East. Here the volume and average hauling distance of wood are increasing year by year and the railroads cannot always handle these tasks. The wood rots and millions of cubic meters which have already been felled and hauled to the railroad are written off and destroyed. The comprehensive processing of the wood in Eastern Siberia will ensure a shortened average transporting distance and this is exceptionally important. Eastern Siberia is an area where over the long run a larger portion of the nation's entire pulp is to be produced. Under these conditions, a specific program for the accelerated development of the LPK has a right to exist.

The economic development of the area is also aided by the long-term program for cooperation among the CEMA nations in the area of the pulp and paper industry. This

involves the construction of the Yenisey Pulp and Paper Combine and the Boguchany Pulp Plant. A significant portion of the products from these enterprises will be delivered to the CEMA nations.

The decisions of the 26th CPSU Congress set the task of the accelerated development of the pulp industry in the 1980's. A specific program for the assembly-line construction of the LPK should have a single client in the form of the directorate for the construction of the LPK. Its absence has had a negative impact on the planning level. The only major contractor in Eastern Siberia which has carried out work in the building of the LPK in amounts of around 200 million rubles a year, the USSR Minenergo is planning a sharp reduction in the amount of work for 1981-1990, although there are experienced and strong construction collectives for organizing assembly-line construction of the LPK and GES in Eastern Siberia.

How to Accelerate the Development of Minerals in the Transbaykal North

Regardless of the very little geological study of the Transbaykal North, here diverse and unique minerals have already been discovered. There is every reason to expect new discoveries which will make major corrections in our idea on the region's natural resources.

On the route of the BAM, there is no mountainous area with such difficult natural conditions as the Buryat and Chita north. Favorable conditions for life are found only in the Muya Valley. In terms of natural conditions, it is an unique phenomenon for Siberia. It has a less cold winter than in other places, less precipitation and a warm summer which contributes to the good warming of the air and ensures a good harvest for a whole number of agricultural crops. Here are tens of thousands of hectares of fertile land capable of providing the basic food products (vegetables, meat and milk) for the inhabitants of the future Muya energy-industrial area.

For this reason, in my opinion, the value of the Muya Valley for the locating of mining-processing combines, related production and the construction of new towns and settlements of the energy-industrial complex is very great and here effective regional development is most correctly combined with the tasks of constantly increasing the well being and satisfying the spiritual needs of the population. In the area of a number of deposits, due to the severe natural conditions, it is advisable to engage only in the mining of the ore, including the use of the rotating crew method.

The construction pace has risen on all the sections of the BAM. At present, subdivisions of construction workers are successfully at work in the Muya Valley from Muyakan to the bridge on the Vitim River. Conditions have been created for the preparatory work involved in building the Muya Power Complex.

For developing new areas it is essential to utilize the positive lesson of Bratsk. It is essential to have the scientific setting of the directions for developing new areas. It is also essential to have a general contractor in the form of the Construction Administration of the Muya Power Complex. The setting up of a single construction organization and the efficient use of the production facilities of Bratskgesstroy beyond any doubt will contribute to development.

The successful carrying out of the preparatory work and the subsequent construction of the mining and processing combines and a complex of nonferrous metallurgy and

chemical plants will depend largely upon the organization and management of the program for creating a new production base for nonferrous metals. Obviously, this should be the directorate of the USSR Ministry of Nonferrous Metallurgy which is responsible for the development program. In this instance the program will be carried out in a planned manner, considering the achieving of the ultimate goal and not the particular tasks.

For developing the productive forces in the north of the Transbaykal area and for providing the adjacent areas with cheap hydroelectric power it is essential to build GES on the Vitim River. It would be advisable to accelerate the start of construction on the Mokskaya GES with a capacity of 1.3-1.5 million kilowatts generating 6.7 billion kilowatt hours. Construction has been started on a railroad bridge some 30 km from the site of the Mokskaya GES. A service road has been built to the construction area and in 1981 the high voltage Muyakan—Vitim line was put into operation.

In the future, the Moksyaya GES will be the main link of a power system which will also include the Ust-Ilimsk GES and the Neryungri GRES. It is located at the center of the power loads. Its completion will make it possible to meet the growing demand for electric power in the zone along the route of the BAM in the section from Ust-Kut to Tynda. A significant portion of the electric power will be transmitted outside the BAM zone, to the north to the area of Bodaybo for increasing the dependability of power supply and for shifting the unprofitable thermal power plants into the reserve.

Here it is essential to consider that in the zone, for reasons of the harmful impact on nature, it is not advisable to build TETs and the Mokskaya GES here will be a possible source of power supply. A delay in the start on its construction will also defer the industrial development of the Transbaykal north.

The Amount of Construction: Should We Increase or Decrease?

During the 11th Five-Year Plan, Bratskgesstroy was to complete 1.49 billion rubles of work on the territory of the Bratsk--Ust-Ilimsk TPK (during the 10th Five-Year Plan, 1.707 billion rubles was completed). The peak in the amount of work carried out over the years came in 1976, after which there has been a constant decline. The Bratsk--Ust-Ilimsk TPK is marked by an advantageous geographic position, as it is in the central portion of the new developing industrial belt of East Siberia of the Yenisey, Bratsk and Vitim. This TPK has every opportunity to provide the necessary increase in the capacity of the construction industry for developing the region, including free resources of construction workers (the decline in the five-year plan) and a large experienced collective of operators.

The delay in resolving this problem has inevitably led to large irrational shipments. At present, the workers of Leningrad ship their reinforced concrete past Bratsk to Severobaykalsk. Analogous prefabricated reinforced concrete is sent west in the reverse direction to Krasnoyarsk Kray for the KATEK [Kansk-Achinsk Fuel and Power Complex].

Now comes the intensive development of the BAM zone. Having planned in the 11th Five-Year Plan for increased capacity in the construction industry of Bratskgesstroy, we will avoid the mass irrational shipments from the western regions of the nation. We plan to open through traffic along the BAM route in 1984. In the future, trains with nonferrous metal concentrates will move along the BAM. It will be possible to develop the Udokan copper deposit, the Kholodninskoye lead and zinc deposit; the

Dovyrenskoye and Chayskoye sulfite deposits of copper, cobalt and nickel. Further processing of the concentrates (metallurgical conversion and refining) can be organized in Eastern Siberia, for example, in the Bratsk--Ust-Ilimsk TPK.

Specialists are examining the competing sites, but for the metallurgical stage, in our opinion, the region of the Bratsk--Ust-Ilimsk TPK is preferable. Here it would be possible to locate a complex of large nonferrous metallurgy and chemical plants. Perhaps not now and even, possibly, not in the next five-year plan, but here the plants will go up without fail. The question is merely whether the new production should appear like a bolt out of the blue or whether it is possible to forecast the future and move toward it even now.

It is essential to prepare for the tapping of the natural riches even now. It is a major error to plan a further reduction in construction in the Bratsk--Ust-Ilimsk TPK. The 11th Five-Year Plan should become a time for creating a vast bridgehead here for a powerful offensive on the very rich natural treasures of the area. The famous collective of Bratskgesstroy is the key to these treasures.

Don't Obviate the Experience of Bratskgesstroy

The experience of creating the Bratsk--Ust-Ilimsk TPK has long been thoroughly analyzed by our press. The flaws of the noncomprehensive, departmental approach to forming the production and social infrastructure of the TPK have been taken up particularly widely. But the positive experience of organizing construction has undeservedly been little analyzed. The figures do not lead, but merely show how to lead. Let us take up the development figures: in 1955 (the start of construction) it was 12 million rubles; in the 6th Five-Year Plan (1956-1960) it was 406 million rubles and in the 7th Five-Year Plan (1961-1965) 935 million rubles. A true construction explosion which established the basis for all the subsequent achievements of the Bratskgesstroy collective.

In 1961, four units of the Bratsk GES were put into operation in a record short time. By this year, Bratskgesstroy had used 597 million rubles, including 422 for the Bratsk GES and 175 for other construction projects. In 1961, 179 million rubles were used, including 108 million rubles for the Bratsk GES.

As can be seen from the given figures, a territorial construction organization is capable of providing extremely intense increase rates for the volume of work performed while the construction times of the individual projects is reduced simultaneously.

In utilizing the advantage of a territorial construction organization, Bratskgesstroy was able to create over a short period of time in an undeveloped area a base for the construction industry, the Bratsk power-industrial center and the Korshunova industrial center. This experience certainly must be improved, but the main thing is to disseminate it widely. To obviate it would be sheer wastefulness.

The industrial belt of the Yenisey, Vitim and Bratsk consists of four TPK: the lower Angara, Bratsk--Ust-Ilimsk, Upper Lena and Northern Baykal. All the TPK of the region, analogous to Bratsk, consist of power-industrial and industrial centers. The great scale of transforming the region and the short times for carrying this out under conditions where the extensive forms of development have exhausted themselves--all

of this requires the greatest possible reliance on the positive experience in organizing construction at the Bratsk--Ust-Ilimsk TPK.

The power-industrial and industrial centers of the region should have territorial construction administrations (analogous to Bratskgesstroy) combined into a regional construction organization. This is all the more essential as the region includes the territories of two oblasts, one kray and one autonomous republic.

The unified territorial construction organization in the region would act as the connecting force unifying the interests of the departments and the region. An organization which has its own design construction institutes and strong modern construction industry will provide a new stage in the development of construction, a new "notch" in scientific search and the revision of the already found and tested solutions in the aim of increasing their effectiveness. It would be hard to overestimate the role of creating such a construction organization. It will remain the support for developing the entire north of Eastern Siberia.

But, alas, the USSR Minenergo has planned only power construction for Bratskgesstroy outside the Bratsk--Ust-Ilimsk TPK. In practical terms this means that the development of the Lower Angara, Upper Lena and Northern Baykal TPK will be carried out by many construction organizations under different departments. Understandably, this will cause serious harm and mean a major step backwards in the development of construction. The scattering of resources is probably the greatest affliction for us. This was mentioned at the 25th and 26th CPSU Congresses and emphasis was put on what harm this causes the national economy. And we can see the practical results of such an approach. During the 10th Five-Year Plan, for Bratskgesstroy there was a deterioration in the basic indicators of economic activity and in 1981 there was a sharp decline in the amount of work.

Obviously, the organizing of construction on newly developed territories requires special attention from the central planning bodies. For coordination of development we must have an intersectorial management body which is capable of bringing together the departments for common construction activities. The creation of such an intersectorial center must not be delayed and meets the spirit of the "Basic Directions for USSR Economic and Social Development for 1981-1985 and for the Period Up to 1990."

10272
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FEEDBACK'S PLUSES, MINUSES IN A DYNAMIC PLANNING ENVIRONMENT

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 75-84

[Article by A. F. Myrtsymov, winner of the USSR State Prize and member of the Council for Senior Metallurgical Workers under the USSR Minstry of Ferrous Metallurgy from Moscow: "When Feedback is Weak"]

[Text] Two and a half decades ago the author of this article turned to a colleague, the chief of the Technical Administration of the then Ministry of General Machine Building, with a request to help the metallurgists automate the control of blast furnace operations. His almost verbatim answer was: "Give us a formula which would describe the process and we will do everything that you want." The specialists were convinced that on the basis of a so-called static model which in sufficient detail "played through" one or another process it was possible to have completely reliable and effective automation.

However, it turned out that even the most detailed formula or system of formulas was unable to consider all the possible deviations in the initial parameters of the raw materials, the energy resources and consequently in the course of the process itself. It turned out that for any satisfactory automatic control it was essential to continuously receive reliable information on the actual course of the process being controlled and considering this information to make changes in the system of control actions. Numerous pick-ups were required which would collect this information and transmit it to the control computer (or system of computers) and sometimes converters which gave a more convenient and computer "understandable" form to the signals coming from the pick-ups. Thus, it became clear that without feedback it was impossible to effectively control a process or unit and the urgent need for dynamic control became apparent.

The author recalled this episode not in order to share his memories from the history of organizing automatic production control in ferrous metallurgy. Rather it is a matter of urgent questions concerning an improvement in economic management in light of the decisions of the 26th CPSU Congress. In the "Basic Directions for Soviet economic and social development for 1981-1985 and for the Period Up to 1990," from analyzing the results of economic activities in 1976-1980, in particular, the following conclusion has been drawn: "In the area of increasing production efficiency and raising labor productivity it has not been possible to solve the problems as outlined in the plan. The management and planning mechanism, the management methods and the level of labor and executive discipline have lagged behind modern requirements. This has impeded the conversion of the national economy to the intensive development path."

We are convinced that one of the crucial reasons for this lag has been the insufficient development of a feedback system in the management of economic development. Well organized feedback is essential for dependable management even for a relatively simple production process as blast furnace or oxygen-converter casting. The incomparably more diverse and diversified tasks of managing the exceptionally complex economic mechanism which is enormous in scope, relationships and effects all the more cannot be successfully carried out without permanent feedback.

The Strength and Weakness of Feedback

It is generally assumed that by feedback one should understand the effect of the results of economic activities on those workers of the production, economic, management, planning and control personnel who have a substantial influence on these activities. What is actually the case here?

The direct participants in production such as the workers, foremen, the heads of shifts and the leaders of shops, directly feel the results of their activities (at least in terms of the quantitative indicators such as tons of coal and steel, a pair of footwear, meters of textiles and so forth). But even on this level, many qualitative criteria as well as the indicators of production efficiency often are not directly reflected in wages, bonuses, awards and so forth.

It might be argued that the qualitative characteristics of a product are included among the criteria for evaluating and paying for the labor of the direct manufacturers of the product. This is not completely so. Take the labor of a rolling mill worker. The plan for a rolling mill or shop is set, as is known, in tons. The labor of the rolling shop personnel is paid for in tons as well. When the plan presents difficulties, the metallurgical workers often have the consumers agree to accept rolled products with a diameter, for instance, of not 10 mm but rather 12, since in rolling a 12-mm bar the productivity of the mill (in tons) is increased by 30-35 percent in comparison with a 10-mm shape. Since the rolled products are delivered in tons, the consumer fails to receive the corresponding amount of bar in meters.

For the metallurgical workers the plan has been fulfilled, the workers receive bonuses and other benefits while the national economy in the meanwhile ends up with a major loss because, in the first place, fewer consumer units have been manufactured in meters of rolled products and, secondly, for manufacturing stock from rod that is 12 mm and not 10, the excess 30-40 percent of the steel is lost in chips. We must not forget that for the nation the volume of the annual "production" of cuttings approaches 10 million tons, significantly exceeding the corresponding indicators in other industrially developed nations, including per unit of consumed metal.[1]

Let us move a step higher and enter the plant administration. The enterprise leaders feel the results of their activities in increasing the production volume and in meeting certain qualitative and economic indicators. At the same time, they are in no way interested, for example, in radically altering the structure of steel casting and rolling production. For example, the obsolete open-hearth process has been maintained, even in double-chamber furnaces which leads to unacceptably high iron losses; the cast

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[1] VOPROSY EKONOMIKI, No 7, 1979, pp 35-65.

steel does not undergo refining outside of the furnace and is poured into ingots, without using the continuous ingot-casting method. In other words, if the plant produces low-quality metal which does not meet modern possibilities and needs, the enterprise leaders do not lose anything by this. It means no trouble for them if they do not introduce controlled rolling or heat treating. The plan sets for the plant precisely that metal which the enterprise produces traditionally.

Problems in marketing the metal products do not arise since the metal, even of poor quality, is in short supply. Consequently, the situation here is the same: the national economy suffers losses while the direct participants and leaders of production do not suffer. Conversely, if at a price of effort, concern and particular personal responsibility do seek to organize continuous casting or controlled rolling, they also do not feel the beneficial effect of the changes.

It is quite apparent that such a procedure does not help to improve production. At the same time, strong feedback forces one to act in a very efficient manner. I can recall an instructive story from the same sector which is close to me. The large U.S. metallurgical corporation United States Steel for many years held on to the obsolete open hearth process. As a result, the steel users began to prefer other firms which had energetically introduced oxygen converter casting and electric casting and offered a higher quality metal product. The firm's capacity became greatly underutilized and this led to tangible losses. The corporation's president personally lost many thousands of dollars.

Then the president, along with the chief metallurgical engineer, went to West Germany where they had already developed and introduced the oxygen converter process with bottom blowing of basic cast iron. One of the key merits of this process is that it does not require vertical (put into the converter from the top) tuyeres. The converter is relatively low and it can be installed in a building of an open hearth shop in the place of furnaces. The visitors were shown several melts and they, convinced of the efficiency of the new process, immediately purchased a license for it.

Upon returning to the United States, the firm's leaders quickly converted the open hearth shop to the new process and, in addition, converted to bottom blowing the oxygen-converter shop which had previously been designed for overhead blowing.

The author would err greatly against the truth if he did not admit that the leaders of the Minchermet [Ministry of Ferrous Metallurgy] do not possess, unfortunately, great opportunities for carrying out such radical measures to improve metallurgical production. In actuality the Minchermet is allocated certain capital investment limits and a plan is set which envisages a significant rise in the absolute scale of production. Thus, for the 10th Five-Year Plan, steel casting was to increase by 27.2 million tons and the output of merchant bar products by 19.4 million tons. This should have provided an output of 168.5 and 117.5 million tons, respectively. (The figures also include the metal from outside the Minchermet, however this does not alter the essence of the argument.) The main funds are to be spent on expanding and maintaining capacity in the raw material and initial stages of ferrous metallurgy. However, it is well known that the employment of rational technology makes it possible to produce rolled products with double the strength in comparison with the present and each ton of the new products could replace almost 2 tons of the metal manufactured by the obsolete methods. The development of ferrous metallurgy is continuing, nevertheless, basically along extensive

lines with more and more millions of tons without a fundamental improvement in the quality.

Feedback in the Consumption Sphere

The problems of ferrous metallurgy are being discussed here in such detail because this production sphere is closer to the author than any others. But an analogous situation has also arisen in the other industrial sectors.

The labor of a worker of one or another rank is reflected in his wages. Wages must be turned into consumer goods. Here the worker encounters major shortcomings which also to a significant degree are determined by the weakness of feedback in management. In actuality, in a store for certain goods he encounters lines of greater or lesser length. As is known, in trade and the service sphere the workers lose billions of hours of time, often working time.

Why do lines occur? It can be said because of a lack of goods. This is partially the case. However, it is also known that often a line is the direct consequence of the unsatisfactory organization of trade. But note one particular feature of the lines. A salesperson from a neighboring store does not stand in line and there are no leaders of the trade network there. In other words, precisely those who could bring about an improvement in the organization of trade do not feel the major shortcomings of its present system.

Much is said and written about the successes of the system for the ordering of food products by workers directly at the enterprises and organizations.

But the establishing of such a system merely underlines the flaws in the existing procedures of the trade network which should exist for serving the workers. With an efficient organization of trade (including, certainly, the filling of orders) there would not be any need for an additional trade network at the plants, factories, institutes and so forth.

And why, one might ask, is a person who works, for example, at an aviation or metallurgical plant, at a large institute or design bureau where such a system exists, free from standing in lines while a worker, for example, from a laundry or a savings bank is forced to waste a lot of time there? Where is the economic efficiency here? What does society gain from this except many losses?

For certain types of goods (in particular for meat and certain other food products) there is a completely real shortage. But this long-term shortage depends largely upon shortcomings in agricultural leadership and the weakness of feedback in management. Certainly an executive of one or another rank feels the meat shortage on his own table. And certainly his activities also determine how much meat is delivered to the stores and market.

Understandably it is possible to argue against the ideas of strengthening certain aspects of feedback, saying that in a predominant majority the executives are persons who are highly aware and dedicated to their mob and that they work at full force and without a direct interest in the results of their labor. Certainly such a qualification is valid. However, one cannot seriously accept the reasoning. On what grounds can it be asserted

that a leading steel caster or miner, a spinner or equipment operator (and among them are also deputies to the Supreme Soviet) are less conscientious, less dedicated and less concerned about social interests than the chief of a main administration? The necessity of a material interest has been recognized for the named and many other employee categories. An executive usually not only does not feel the results of his activities, but often does not even have sufficiently up-to-date and reliable information on the actual state of affairs.

Feedback and Intensification

An exceptionally important prerequisite for the effectiveness of feedback channels is the system of planned production indicators. For decades now, the economists, workers and managers of enterprises, writers, journalists and commentators have been saying in their comments that the existing planning system (for example, the output of rolled products, pipe, metal structural elements and many other types of equipment) impels--and cannot help but impel--the production of heavy products. While the production volume is planned and the production result are assessed in tons, a desire will prevail to produce the largest possible amount of these products. Even if this knowingly contradicts the interests of the national economy and, in particular, in a major way prevents its intensification.

Clearly tonnage as the main planning criterion must be replaced by others which reflect the needs and interests of the national economy. Here it is wise to draw attention to the fact that in world practices many types of articles made from ferrous metals are delivered and paid for not in tons, but rather in consumer units such as meters or square meters. At present, efforts are being made to also account for the productivity of rolling mills in the same consumer units.

The following example makes it possible to judge just how significant is the effect on the economy of introducing rational criteria for planning and evaluating the production volumes.[2] In Latvia, an experiment was in planning the output of enamelware in cost terms and pieces instead of tonnage. As a result, the deliveries of products to the trade network over the 3 years rose by 51.2 percent and while in 1975 one ton of sheet produced 1,167 rubles worth of enamelware, in 1977 the figure was 1,850 rubles worth and in 1978, 1,928 rubles worth. For each thousand rubles a metal savings of more than 2-fold was achieved and product quality improved noticeably.

One cannot help but take up one of the particular questions which also concerns the feedback system in management. The discrepancy between the money available to an enterprise, on the one hand, and the real material and labor resources, on the other, is cited as one of the main reasons for the unsatisfactory state of affairs in introducing new equipment. Competition between purchasers (the exceeding of demand over supply) in no way helps to improve product quality, but merely devalues the money which the purchasing enterprise possesses. Conversely, a competition between the producers of the goods and services, that is, the exceeding of supply over demand, causes a desire of the manufacturers to improve the product as otherwise it may not find a buyer.

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[2] I. G. Pashko, V. M. Pavlov and A. N. Spektor, "Strategiya i taktika berezhlivosti" [The Strategy and Tactics of Thriftiness], Moscow, Znaniye, 1980, p 64.

This applies certainly not only to production activities, but also to the personal consumption sphere. Here the scarcity of goods, as has already been mentioned many times, has become one of the crucial reasons for their insufficiently high quality. Scarcity forms the grounds for many property crimes and violations of the law, including bribery, the sale of goods on the black market and so forth. We feel that the time has come to settle the question on the ratio of the mass of goods and money on the market on a more scientific basis. There is the formula of K. Marx which clearly establishes the amount of money necessary for circulation. This ratio also represents a part of the feedback complex and one "pick-up" although an extremely important one. It could provide information on the adequacy of the true course of many economic processes to the planned and could help overcome the gap between the goal and its actual achieving.

The development of feedback in a planned economy presupposes greater responsibility on the part of managers in the various echelons of the national economic planning and management system. For this reason, it would be reasonable to make the wages for all the workers on all levels of production managment and leadership closely dependent upon the results of their activities. Certainly, such a reorganization is a complex process requiring profound preliminary reasoning and analysis. But it seems to me, as a production worker, that the wages (including all their forms and types) for the responsible co-workers of the ministries, the leading workers of the production associations and the functional subdivisions should be formed considering both the results of fulfilling the sector's production program as well as indicators for the technical and economic effectiveness of their personal work. In particular, the indicators for evaluating the activities of the executives of ministries and other management organizations could be worked out in using as the base the corresponding or close-to-existing specifications for products and services in the industrially most developed nations.

10272
CSO: 1820/1

TEACHING RESOURCE CONSERVATION

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 85-86

[Unattributed introduction: "Studying Conservation"]

[Text] "Human projects which do not consider the great laws of nature bring only misfortune," emphasized V. I. Lenin.[1] The system of standards worked out under his leadership for protecting nature underlay the special laws adopted during the first years of Soviet power. Since then a large number of directive documents has been approved on protecting the environment.

The "Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period Up to 1990" as adopted by the 26th Party Congress for the first time established an independent section on "The Conservation of Nature." The congress set out a broad range of scientific-technical, production and management tasks in the area of conservation and rational use of land, minerals, water, the atmosphere, forests and other natural resources.

However, it would be wrong to feel that legislative enactments alone could solve this most important problem. The indoctrination of a considerate, attentive attitude toward the environment, the broadening of knowledge and the developing of skills for rational conservation should become an inseparable part of the overall system for the training and educating of personnel.

These questions, in particular, were the concern of a "roundtable" of EKO and NOVYY MIR published in the journal's third issue for the current year. Now we are returning to the problem of teaching rational conservation.

10272
CSO: 1820/1

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[1] V. I. Lenin, "Konspekt 'Perepiski K. Marksa i F. Engel'sa, 1844-1883 gg.'" [Outline of the "Correspondence of K. Marx and F. Engels, 1844-1883"], Moscow, Gospolitizdat, 1959, p 376.

ECOLOGY MERITS PLACE AS SUBJECT OF STUDY

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[Article by Doctor of Economic Sciences P. G. Oldak, Professor at Novosibirsk State University: "Ecology and the Education System"]

[Text] The protecting of the environment is not only a problem or total of problems, but is something much larger, a way of thinking. For this reason, the shaping of a new awareness is the general basis for converting to the rational utilization of natural resources. This new awareness applies both to the area of philosophy (ideology, culture and ethics) as well as to the area of professional knowledge.

First of all it is essential to take up the questions on a philosophical level. It is a question of shaping an awareness that we live on a planet the resources of which are finite and the laws for maintaining an equilibrium among the ecological systems are complex and far from understood.

It must be remembered that today humanity has gained not only great, but also dangerous technical might. It has moved on to using nuclear power and creating synthetic substances unknown in nature; it has penetrated to the molecular levels of living systems, it has developed the methods and created the equipment capable of destroying the natural systems and has made a start to the conquering of space and to the broad use of the resources in the world's ocean. Science has become an area of the mass production of knowledge. There has been an unusual acceleration in the transition to the practical utilization of fundamentally new scientific discoveries. Much that man could only dream about has already been realized.

At the same time, in our attitude toward nature we still proceed from ideas and notions learned in the past. Our attitude toward nature does not correspond to our new situation where social production doubles its power every 15 years. This attitude toward nature should be based upon extreme circumspection in the use of innovations and the choice of goals. From foreign experience we know that mankind far from always abandons false social goals the achieving of which leads to the squandering of labor and material resources, to a substantial deterioration in the living conditions of the present generation and to the loss of favorable opportunities for future generations.

The problem of selecting the goals and allocating national resources is becoming a field of acute ideological struggle. It is impossible to solve urgent social problems,

to protect nature (the initial conditions for the continuation of life on the earth) and at the same time continue the arms race, to squander resources in a competitive struggle and further broaden the boundaries of prestige consumption. The progressive forces in the nations of the capitalist world are demanding an end to the arms race, a broadening of expenditures for social needs (housing construction, education, public health and the combating of crime) as well as for protecting the environment.

The new social awareness is at the same time an understanding that the time has come to seek out the ways for a changeover to integrated control over the development of social production within the limits of both the national economic systems and also the entire planet.

An examination of the problems of conserving nature presently acts as a new important area of forming a communist ideology. We feel that this aspect should be reflected in the teaching of social disciplines in the secondary schools (history, social sciences) and in the higher schools (political economy, philosophy and scientific communism).

Environmental conservation is a task addressed to everyone: to scientists, politicians, engineers, managers, teachers, school children and housewives. It can be carried out only by the establishing of a new attitude toward nature and new value sets for the conduct of man on earth. This is a task for the entire educational system. It consists not only in teaching a certain sum of ecological knowledge, but also (and this is much more complicated) selecting clear ideas on the relationships of all forms of human activity with the change in the state of natural systems.

From here it follows directly that even on the secondary school level such subjects as geography, botany, zoology, history and social sciences should be viewed as links in an integrated system of knowledge about nature and society.

It is even more important to achieve this approach in higher education. The revising of curriculums in the higher school has already started. Thus, the course "Introduction to the Specialty" which is given on all faculties of VUZes includes a section on "The Protection of Nature" (5 course hours), a course on "The Conservation of Nature" is being introduced (up to 20 course hours) and so forth. With all the importance of the measures being carried out, they cannot be considered sufficient.

There must be a definite reorientation in the structuring of higher education. It should be aimed at shaping a new attitude toward nature, where our right to use all the goods of nature is inseparable from a considerate attitude toward it based upon an understanding of its value and fragileness. The reorientation in the structuring of higher education also includes a changeover to a new level of professional training. This should include knowledge on the ways not only of rationally utilizing the resources, but also ensuring the development of production within the limits of an equilibrium among the ecological systems.

It is also important to introduce a course which would provide an integrated understanding on the relationships of social development, economic growth and environmental conservation. The latter might arbitrarily be defined as a course on "Problems of Biosocial Development."

The realizing of the principles of rational conservation requires new specialists. It is a question not only of ecologists for working in the system of natural resource management bodies. Specialists are needed for carrying out ecological expert evaluations of plans, ecological consultants for work in planning bodies and at enterprises, instructors for the series of subjects in the ecological area for the secondary and higher schools, and teachers with an ecological education for the children's institutions.

As yet, chairs for natural conservation exist in only isolated VUZes of the nation. A very small number of students on certain biological faculties are specializing in the natural conservation area. This is clearly insufficient.

The times demand the introduction of a new specialty with a significant student body on the biological and economic faculties of universities as well as in the economics, engineering-economics and pedagogical VUZes. For this it is essential to begin immediately in preparing textbooks and teaching aids and to create a system of retraining which would make it possible for a portion of the VUZ instructors to master the new specialty.

Special attention should be paid to the question of improving the level of knowledge of those who presently manage production. The older generation studied geography, but did not learn ecology. Everyone knows that nature is beautiful and rich, but they have little understanding about how to protect this beauty and richness. Far from everyone knows the bases of ecology or the laws for the development and support of life on earth. Management and everyone who bears responsibility for the location and development of production should master this knowledge.

Obviously, we must create a definite system for retraining the personnel, work out courses for the principles of rational conservation in terms of each economic sector and make it compulsory for these to be taken by the broadest range of industrial workers as well as the party and state apparatus.

The indoctrination of a new attitude toward nature means the indoctrination of a sense of civic duty. This is communist indoctrination in the highest sense of the given concept.

10272
CSO: 1820/1

CONSERVATION TRAINING'S PLACE IN HIGHER EDUCATION

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[Article by Doctor of Biological Sciences I. P. Laptev, Professor and Head of the Chair for the Conservation of Nature at Tomsk State University: "Conservation Training in the Higher School"]

[Text] In the USSR, the educational system in all areas of environmental conservation operates on all levels of instruction.[1] Here the main role is given to the higher school in which four basic forms of nature conservation education have developed:

1) The including of conservation problems in the general educational and special disciplines or the introduction of the course "The Conservation of Nature" in training specialists in the area of the utilization of natural resources and the production of industrial product (production engineers, designers and so forth);

2) The organizing of narrow conservation specializations based on the existing specialties (power engineering, chemical technology and so forth). The study of special disciplines related to the given specialization;

3) The training of specialists in a broad area (biological, geographic or socioeconomic) in universities and which is carried out through the specializing of students within the existing specialties;

4) The improving of skills for specialists with a higher education on the conservation courses and faculties.

However, not everything has been properly worked out in this system.

Up to now there has been no list of VUZ specialties on environmental conservation, and the specialties have not been worked out for specialists being trained in the universities, the technical and agricultural VUZes. The absence of approved numbers of specialties creates an uncertainty among those who have created their specialization

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[1] In the USSR and other socialist nations, by the environment one understands only the natural (biophysical) environment and not generally everything which surrounds man (the political, social, working, cultural and other environments).

as to their future activities. In the diplomas of these graduates the specialization is not even named.

The question arises: Are such specialists essential? Life has shown that they are. But how many of them should there be and in what area, what organizations would be interested in them and what positions should they hold? There is no clear answer.

Often the chairs themselves place their graduates, using personal contacts and not through planned procedures. Thus, the number of graduates in the specialty "Methods of Recovering Secondary Industrial Materials" in 1978 exceeded by almost 2-fold the demand announced by the ministries and departments. This trend will last up to 1985. An analogous situation has developed for the specialization "The Conservation of Nature and the Rational Use of Natural Resources" in the specialties "Biology" and "Geography."

It turns out that the graduates, on the one hand, find no jobs and on the other, our nation lacks trained specialists for manning the nature conservation system. The existing vacancies are filled by workers without the proper training and this inevitably tells on the quality of their activities and the effectiveness of all conservation work. The need for such specialists in various areas will rise in line with the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Additional Measures to Strengthen Nature Conservation and Improve the Use of Natural Resources" (December 1978). It envisages the organization of a state system for supervising and monitoring the state of nature, the elaboration of integrated territorial plans for conservation and the introduction of positions in the subdivisions for nature conservation in the ministries and in the planning commissions of the republic, krays and oblasts.

Specialists are also required in order to carry out the instructions of the 26th CPSU Congress on improving state management of conservation and the development of ecology.

For this reason, the Gosplan, the Minvuz [Ministry of Higher and Secondary Specialized Education] and the USSR State Committee for Hydrometeorology and Environmental Control in the near future should find the ways and means for determining the annual demand of the ministries for the appropriate specialists. Possibly the job descriptions being worked out by the USSR Minvuz will help the leaders of the sectors in more intelligently forming this demand.

The time has come to establish the base VUZes for training specialists in the area of rational conservation on a regional aspect, that is, in accord with the natural and economic specific features of the region and the presence of skilled personnel in one or another VUZ. These VUZes could establish close contacts with the enterprises and organizations interested in specialists of the given specialty. Considering their requests, the curriculums and the subjects of diploma projects could be adjusted. The students should undergo on-job practical training at these enterprises, and this should be for at least 8-10 months.

As before, there is the urgent major problem of instructors. Success in this area cannot be guaranteed by the formal training of instructors or by the drawing up of curriculums and educational materials. It is essential that the pedagogues themselves be profoundly aware of the goals and tasks of this type of education.

We feel that chief attention should be focused on the training of coordinating and consulting pedagogues in the various disciplines who would be capable of coordinating the curriculums with the real processes in the environment, to establish cooperation with journalists, specialists, public and state figures and to head the conservation movement of the youth. It is essential that the instructors engage in scientific research to improve their skills and more often be present at enterprises. Unfortunately, at present, many of them out of inertia carry out research and practical work on subjects which are remote from the problems of rational conservation.

Among the numerous scientific-procedural councils of the USSR and Union republic minvuzes, one will not find a council on conservation education, although the need for this is being evermore acutely felt. These functions could be assumed by the section for education in the area of the environment of the Interdepartmental Scientific-Technical Council on Interdisciplinary Problems Related to Environmental Conservation and the Rational Use of Natural Resources Under the USSR GKNT [State Committee for Science and Technology]. For now it has few forces for this while the scope of work in the area of coordinating all scientific and practical activities in this area is rather large.

We feel that it makes sense to entrust this section with the coordinating of work being done by the ministries in preparing the textbooks and teaching aids adapted for the various specialties of the different schools. This will ensure a standardizing of the basic concepts and terms and will raise the quality of textbooks. At present, there are 25 textbooks on the general course of conservation, but only individual ones for many of the special subjects.

Work must be done on the interdisciplinary programs. These are a list of questions scheduled for the years of instruction and for the disciplines and reflecting rational conservation considering the specialty of the specialists being trained. Analogous questions should be incorporated in all practical work as well as the course and diploma work. At present, conservation problems, as a rule, are introduced by the VUZes themselves into the special and general disciplines and some do this on the proper level while others do it formally, regretting the study time for these purposes. The leadership and control from the Minvuz are insufficient.

Specialists with ecological training are already working in the national economy. It is time to establish feedback with them so as to ascertain the flaws in their training. This work could be carried out by the USSR Minvuz with the involvement of the Section for Education as well as the Union republic minvuzes. For this purpose it would be advisable annually or once every 2 years to convene national or republic conferences for the heads of the corresponding chairs.

As for working specialists and leaders, here also much remains to be done. In particular, in our view, we must organize regular and correspondence ecological courses under the ministries and state committees, issue diplomas for their completion and consider this in promotions. On the job, in organizations, scientific research institutes and VUZes, scientific-practical conferences and seminars should be held periodically on rational conservation in accord with the specific job.

There still are many unsolved questions in the area of conservation education. Much joint work remains to be done by all the involved ministries, the state committees,

scientific and academic institutions and by social organizations. It is time to move on more actively from a discussion of the problems to a settling of them.

10272
CSO: 1820/1

FIRST GLOBAL INTERGOVERNMENTAL CONFERENCE ON ENVIRONMENTAL EDUCATION

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[Unattributed conference report from materials published in the UNESCO COURIER, No 6, 1980: "The First World Intergovernmental Conference on Education in the Area of the Environment"]

[Text] This conference was held in Tbilisi in October 1977. Participating in it were more than 60 governmental delegations, representatives and observers from institutions of the UN system and nongovernmental organizations, a total of 330 participants.

Having discussed a broad range of questions, the conference adopted a declaration and over 40 recommendations. These outlined the role, goals and guiding principles of education in the area of the environment, the strategy for its development on the national and international levels. A significant place was given to the questions of developing scientific research and standardizing terminology (there are plans to work out a glossary of terms which would include around 1,000 concepts and terms).

The conference concluded that education in the environment area, due to its nature, can greatly update and improve the entire educational process, having focused it on solving problems of concrete reality. In this regard, it was proposed that the states adopt special legislation on education in the environment area. Such legislative enactments have been adopted only in several nations, although in many ones there are conservation laws. For ensuring effectiveness on a national level in exchanging experience and disseminating information as well as in coordinating efforts to work out curriculums and texts, for the ecological training of instructors and managers, it was recommended that each state create a specialized body.

The guiding principles were formulated for education in the environment area. Education in the environment area should:

1) View the environment as a whole, that is, the natural and the man-created, considering the technological and social aspects (economic, political, cultural-historical, moral and aesthetic);

2) Be continuous, that is, to commence on the preschool level and continue through all stages of formal and informal education, for one's entire life;

3) Have an interdisciplinary nature, relying on the specific content of each discipline and as possible create an integrated and balanced future;

4) View the basic environmental questions from the viewpoint of the local, national, regional and international levels so that the students well understand the environmental conditions in other geographic areas;

5) Focus attention on the present and future state of the environment;

6) Provide an opportunity for the students to participate in planning instruction and create conditions for them to take decisions;

7) Help ascertain the symptoms and the true reasons for the rise of environmental problems;

8) Develop critical thinking and the habits of solving problems;

9) Make wider use of practical activities and advanced experience in instruction.

10272
CSO: 1820/1

FIRST ALL-UNION CONFERENCE ON ENVIRONMENTAL EDUCATION

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 95-97

[Unattributed conference report from the First All-Union Conference on Education in the Area of the Environment (July, 1979, Minsk)]

[Text] The conference participants assembled in July 1979 in Minsk not so much to establish the state of affairs in the area of environmental education as to determine the specific measures for developing this on all levels in the USSR. There were three sections: "Higher and Specialized Secondary Education, The Training of Personnel and Improving the Skills of Specialists," "Preschool, School and Vocational-Technical Education, Improving the Skills of Teachers and Instructors," and "Propagandizing of Conservation, the Activities of Public Organizations and Mass Information Media."

As a result, 74 practical recommendations were adopted addressed at specific executors.

It was recommended that the USSR and Union republic ministries of education:

1) Assign to the schools a natural territory for training hikes and small preserves;

2) Organize regional training centers for improving teacher skills;

3) Incorporate the subject of nature conservation in the standard curricula for general education schools;

4) Work out an interdisciplinary program for conservation education in the schools;

5) Publish teaching, procedural and visual aids, workbooks, readers and so forth.

The USSR State Committee for Vocational-Technical Education should:

1) Correct the existing programs for the vocational-technical and educational series;

2) Assign more time for extracurricular exercises on conservation;

3) Organize the corresponding retraining of pedagogues and so forth.

The USSR Ministry of Higher and Secondary Specialized Education [Minvuz] should:

1) Organize the training of specialists in the environmental area, combining the general problems of nature conservation and the specific questions of the rational use, reproduction and conservation of natural resources;

2) Work out and disseminate among all schools an interchair (interdisciplinary) standard program considering the specialty of the specialists being trained;

3) Open up a specialty for environmental conservation and the rational use of resources;

4) Organize retraining of working specialists and teachers;

5) Organize permanent inspecting of the state of affairs in conservation education and so forth.

The Union-republic councils of ministers and ministries should: accelerate the drawing up of a list of positions which should be held by specialists with a higher and specialized secondary education in conservation and on the basis of these lists determine the demand for such specialists up to 1990 and submit the corresponding requests to the USSR Gosplan and the USSR Minvuz.

The USSR Gosplan and the USSR Minvuz should: establish the demand of the sectors for specialists over the long run and establish the base institutes for their training.

The USSR and Union republic academies of sciences should: incorporate the conservation subject in the plans of methodological seminars and courses for the advanced training of scientific and scientific-technical workers and broaden the training of scientific personnel through special graduate studies.

The USSR State Committee for Standardization and the section on education should: standardize terminology on the questions of education in the area of environmental conservation and prepare terminological encyclopedic references.

The USSR State Committee for Television and Radio Broadcasting should: incorporate in the Central Television Program a broadcast on "Man and Nature" which would pay particular attention to advanced experience and to taking up activities within the international programs.

10272
CSO: 1820/1

FORMING THE ECOLOGY-ORIENTED THINKING OF FUTURE ENGINEERS

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 98-102

[Article by Doctor of Technical Sciences V. F. Maksimov, Professor and Head of the Chair for Labor Safety and Environmental Conservation, and Doctor of Agricultural Sciences G. V. Stadnitskiy from the Leningrad Engineering Institute for the Pulp and Paper Industry: "Shaping the Ecological Thought of Future Engineers"]

[Text] The new course on "Protecting the Environment" in the VUZes is in the stage of development. In our institute the teaching of this is based upon the simple and clear idea that environmental conservation is not a separate science, but rather a general principle in the use of nature the realizing of which provides the inexhaustibility of the material resources required by society and the maintaining of the conditions necessary and sufficient for the existence of life on earth. Such an interaction between man and nature was termed by V. I. Vernadskiy the noosphere, a sphere of reason possible certainly under the conditions of a socially mature society.

Each worker in any sector must responsibly carry out the rational use of nature or assist this in his job. His professional thinking (training in a VUZ) should be economic, that is, aimed at assisting those methods of production which, along with improving labor productivity, quality and the volume of produced product, are an indispensable condition for maintaining the quality of the environment. In other words, in our view, there cannot be specialists per se in the conservation of nature since each worker--biologist, lawyer, production engineer, state arbitration worker or preserve worker--should carry out work in ensuring conservation conditions, in being a professional in his narrow sector.

Considering that "The Protection of the Environment" is a sociopolitical and philosophical course, its program, along with the questions of the rational utilization of all natural resources, has included philosophical, economic, legal and international questions. However, this material does not duplicate the contents of the special sociopolitical and technical courses.

The central idea of the course is that the growth of the population, scientific-technical progress and the related increasing rate of utilizing the natural resources and the effects of man on nature (including also the negative consequences) are objective processes. In and of themselves they do not lead either to a resource, ecological or food crisis. These processes cannot be halted and their negative costs can be managed. From

this it follows that under the conditions of a socially mature society, scientific and technical progress is the sole condition for solving the ecological, energy and raw material problems.

Environmental conservation at the present stage of scientific and technical progress is a problem predominantly that is technical and consists in the creating of low-waste production methods, closed production cycles, the use of modern methods for the treating of smokestack gases and waste water, and the recuperation, regeneration and utilization of the so-called wastes which are in fact a valuable raw material. A powerful conservation industry has been organized in the USSR. It represents an independent production sector and is viewed as the engineer conservation of the environment. Hence, the need to train specialists precisely for this sector as is being done, for example, at the Leningrad Order of the Red Banner Engineering Institute for the Pulp-Paper Industry and other institutes.

Ecology, like a scientific discipline, only arbitrarily could be termed an independent area of knowledge. Its informational content includes the general concepts and ideas concerning the laws governing the interaction of organisms and the environment on the level of the individual, the population, the ecological system and the entire biosphere. These laws are related to the physical laws, they are common to all living things and form the content of a relatively small-sized course.

For a production specialist, ecology is a general world view, a part of his ideology, a certain general principle of approaching the problems of modern conservation in his practical activities. For this reason, a modern specialist from any sector should know the laws of interaction of organisms and the environment, the circulation of matter, and the conversion of energy in the ecosystems. If a designer or production engineer does not understand that a body of water or an area of soil where the wastes of his enterprise are to be released is a complex hierarchically organized system which develops according to special laws and cannot assess the consequences of pollution or control from these system positions, then obviously the need to adjust the production methods, increase the dependable operation of the treatment facilities or forecast the quality of water or the atmosphere will simply not come to mind. Equally a lawyer will be unable to conduct arbitration cases involving the environment or pollution while a planner will be unable to correctly anticipate the necessary plans, personnel and expenditures.

A course on the general fundamentals of ecology, in including the above-given content, is given to students specializing in the area of the recovery of secondary industrial materials, precisely in order that they understand sufficiently broadly the tasks of their profession and its end goals. For other specialties, the same questions have been included in the course of environmental conservation as the ecological bases for the rational use of nature. Moreover, in all the remaining sections of this course, the principles for the exploitation of various resources are tied to the solving of conservation problems while the environmental pollution processes are studied from cybernetic positions as a system of interference in the biogeocenoses.

However, the conservation-education system for the students does not end with this. As much as environmental conservation is a technical and engineering task, it naturally should also be served by all the general educational, general technical and special disciplines comprising the curriculum. Thus, the control over environmental wastes

in natural environments and the forecasting of the distribution of impurities are based upon the methods of analytical chemistry and mathematical modeling; the protection of atmospheric air is largely tied to the technology of thermal power production and the operation of boiler units; the protecting of bodies of water against organic wastes from the pulp and paper industry is tied to improving the production methods of pulp, paper, paper-making machine building and so forth.

In summing all that has been stated, it can be asserted that there is no discipline of study which could operate without the instilling of ecological thinking.

The USSR Ministry of Higher and Secondary Specialized Education has confronted the nation's schools with the task of working out interdisciplinary plans for the continuous conservation education of the students. Such a plan has been in effect at our institute for more than 5 years now. It is aimed at making certain that the curriculum for any discipline of study, including foreign languages and bookkeeping, includes questions which with its aid could be resolved by a production worker for rational conservation. Thus, conservation instruction is carried out virtually daily, from the first semester to the diploma project. The latter, like the routine course projects, if they are not specially devoted to the engineering questions of conservation, provide a required section which analyzes the conservation state at the enterprise where the student underwent practice training.

Our experience indicates that the school children arrive at a technical VUZ with very little knowledge of elementary biological questions. We feel that an entrance exam for biology in a technical VUZ is an urgent necessity if we want ecological indoctrination and education to become truly continuous. Such education should not halt after the VUZ. The questions of ecology are presently not included (2-4 hours at best) in the curriculums for the advanced training faculties. It is essential to more widely retrain personnel in the area of ecology and the rational utilization of natural resources by using special faculties.

10272
CSO: 1820/1

ECONOMICS OF CONSERVATION AS A FIELD OF STUDY

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 102-105

[Article by Doctor of Economic Sciences P. M. Nesterov, Professor and Head of the Chair for the Economics of Conservation at the Moscow National Economic Institute imeni G. V. Plekhanov: "For Conservation Economics--Its Own Specialists"]

[Text] Without a comprehensive economic assessment of the condition of the environment, it is difficult to judge the trends of economic development. It is essential to speak now about the cleanliness of the environment in a professional language of figures and not in the language of good intentions.

How much do pure water and clean air cost? These questions just 10-15 years ago seemed strange. But now, no significant construction is financed without a detailed elaboration of conservation measures. The expenditures on creating purification systems at industrial projects comprise up to 20 percent of the total value of the fixed productive capital. Starting from 1974, the state plan for national economic development has shown as a separate indicator the amount of state capital investments for measures relating to conservation and the rational use of natural resources. In the Tenth Five-Year Plan, this was 9.3 billion rubles (6.2 billion in the Ninth). If one considers the expenditures on the operation, repair and reconstruction of already existing treatment works and on maintaining the monitoring services for the state of the environment and so forth, this figure would rise substantially. However, the integrated economic effectiveness of these expenditures is still low.

One of the basic reasons, in our view, is the lack of specialists in the economics and comprehensive planning of conservation in the scientific research and design institutes, the associations, ministries and planning bodies.

The nation is training specialists with a higher education in narrow areas of environmental conservation, including production engineers, hydraulic engineers and biologists. They undoubtedly are essential, but there is not enough of them for completely solving the question of the planned regulation and control over the effectiveness of conservation in all elements of the national economy.

The absence of specialists who are broadly trained in the economics of conservation and know the technical-economic, ecological-economic, economic-organizational and other relationships and who are able to embody them in comprehensive regional and

national economic development plans has led to a situation where up to now the economic mechanism for an evolutionary transfer of the conservation system from the state budget to cost accounting has not performed properly. The losses related to this have been estimated, according to our preliminary figures, at tens of billions of rubles a year.

For training broad-area specialists, in 1976 the first chair for "Conservation Economics" in the nation was established at the Moscow National Economic Institute imeni G. V. Plekhanov. Prior to its organizing, ecological questions were partially taken up at the institute only in two subjects: "Principles of Farming, Crop Raising and Livestock Raising" and "The Economics, Organization and Planning of Agriculture." But this was not sufficient to satisfy the needs of statewide and regional conservation in the nation. The aspects of international relations in this area were not touched upon.

The new course "The Economics of Conservation" has united three related disciplines: the economics of waste-free territorial production complexes, agriculture and the nonproduction sphere. It, in particular, examines the questions of systems analysis of the material and energy flows in basic and auxiliary production, the linkage of individual production methods and lines, cooperation between enterprises of a regional system in producing products and for conservation measures, and the effectiveness of capital investments into the development of the production processes and into a system for the removal of toxic impurities from the production waste products.

The introduction of the new discipline makes it possible to bring out the basic content of problems related to the rational use and reproduction of natural resources and environmental conservation as well as the ways for resolving them. However, such an approach to improving the teaching of conservation economics is not enough. The necessity has already arisen of training graduated specialists.

Since the organizing of the chair, many students in the specialties "National Economic Planning" and "Economic Cybernetics" have successfully defended diploma projects (with the recommending of introduction for the basic research results into the national economy). Over this same period, three candidate dissertations and one doctoral dissertation have been defended.

The co-workers of the chair have not restricted themselves to just teaching. They are also conducting scientific research under state budget and contractual relations. They are working out the methods and models of planning, reproducing and rationally utilizing the natural resources in statewide, sectorial and rational breakdowns, procedural instructions on compiling schemes for comprehensive research conservation and economic estimates for the confiscation of land in large hydraulic engineering construction.

In 1980, an analogous chair was organized at the Moscow State University imeni M. V. Lomonosov. Thus, our nation already has scientific-pedagogical collectives which are capable of training specialists in the area of conservation economics. Now the question is up to the USSR Ministry of Higher and Secondary Specialized Education which should establish the specialty "Conservation Economics."

As was shown by a sampling made in the chemical and forestry industry, construction and agriculture, specialists of this specialty have been needed for more than 10 years

now to solve very important tasks in the area of increasing the effectiveness of social production. They will be able to systematically solve economic, social and ecological questions of conservation at enterprises, in sectors, in the regional and statewide planning organizations, in scientific research institutes and in schools.

10272
CSO: 1820/1

ECOLOGY STUDIES BROKEN DOWN INTO FOUR GROUPS

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[Article by Doctor of Biological Sciences B. G. Ioganzen, Professor at Tomsk State University: "Ecological Education Should Begin in Primary School"]

[Text] Our schools since the 1920's have begun to devote attention to conservation questions. As a rule, these are taught by the teachers of conservation, biology and geography. It was a question of indoctrinating in the school children a love for nature which usually was associated with beautiful plants and animals. The children were taught to take care of these, in the spring to greet the birds flying in from the south and in the winter to feed the wild animals remaining around man.

This was the case up to the 1940's and 1950's when it began to be understood that these studies were not sufficient. The school children began to be more actively involved in landscaping the areas around the schools and working in the "green" and "blue" patrols. Naturalist work was also commenced in the Pioneer camps; school forestry organizations and so forth arose. Of important significance was the Law Governing the Conservation of Nature in the RSFSR (1960). As before, the teachers of natural science and biology remained the basic leading force.

By the end of the 1960's, the need had arisen of altering the attitude toward conservation among the population, having explained that this is not a children's amusement which ends with school (as had been the case before), but rather a serious concern which must be present all one's life. In the school the center of gravity in conservation had to be shifted from extracurricular activities to teaching and in all subjects, starting with social science, history, Russian and literature and ending with physical culture and job training.

The USSR Academy of Pedagogical Sciences has worked out the corresponding procedural instructions, however the interdisciplinary program has been introduced far from everywhere. There is no special subject.

As was pointed out by L. I. Brezhnev at the 26th CPSU Congress, "the quality of the school programs and textbooks needs improving.... They are excessively complicated." In actuality, the textbook "Obshchaya biologiya" [General Biology] for the 9th and 10th grades devotes just 50 pages out of 320 to the section "Relationships of the Organism and the Environment." On the other hand, substantially more attention has

been paid to the proofs of evolution, to the questions of cytology and to other special subjects a knowledge of which is scarcely necessary for persons not intending to specialize in this. Great work remains to be done in revising all secondary education, now in a spirit of broadly introducing the principles of ecological knowledge into all subjects (in the broad sense).

The basis of professional ecological knowledge must be established precisely in school, since only a portion of the graduates will continue their education in the VUZes. The school graduates going into various spheres of production should already be aware of the specific tasks confronting them in the area of conservation on the job.

Among the numerous tasks in the area of environmental conservation, one can establish four groups.

In the first place, it is essential to establish measures on protecting the environment which would prevent its degradation and ensure the possibility of the existence of mankind and life generally on the earth. This can be achieved only on the basis of a fundamental reorganization of the economy on the principles of the ecologicalness of production, that is, ensuring as much as possible low-waste production methods and recycled water supply.

The second place belongs to the questions of the rational utilization of the nonreplenishable natural resources. The reserves of oil, coal, ores and other minerals formed during the period of the planet's formation are limited and nonreplenishable. It is essential to extract these fully from the deposits and to make complete and economic use of them. It is essential for the population to universally understand the tasks of a thrifty attitude toward all types of raw materials and soil.

In third place are the questions of the rational utilization of replenishable natural resources. It is a question of atmospheric air, fresh water, vegetation and the animal world which under normal ecological conditions are capable of self-replenishment and unlimitedly long existence, but can be easily undermined and depleted as a result of irrational economic activity. The annual consumption of the annual increase of these resources by man is rational.

Finally, in fourth place one must put the so-called monuments of nature (interesting mountains, lakes and areas of characteristic landscapes) and its individual elements and for the preservation of which preserves are organized, Red Books are drawn up and so forth.

The tasks of ecological education as established in the secondary education school and then developed in the specialized secondary and higher institutions of learning come down to the following:

a) Disclosing the essence of the processes involved in man's relationship with nature, man's dependence upon nature and the necessity of a considerate attitude toward it;

b) The instilling in each of a feeling of civic responsibility to the present and future generations for the conservation of nature;

c) To teach the professionally correct solution to the questions of utilizing the air basin, the water and soil resources, minerals, vegetation and animal world as well

as the monuments of nature both in the process of labor activity, as well as in everyday life and in recreation in nature.

The designated triune task of ecological education consists, to put it briefly, in developing human conduct which is in accord with nature. A man must think out his every step and clearly realize its consequences and this is far from simple. It is easier to fell a forest than to grow one; it is easier to drain a swamp than to correct the consequences of reducing the groundwater level on the adjacent territory; it is easier to build a dam across a river than to restore the reproduction of the stocks of valuable migrating fish which have been cut off from their spawning grounds....

Unfortunately, there still are schools, and with an established and experienced faculty, in which the conservation of nature is understood on a purely biological level. The practical actions of the school children are important, but they should act only as a means of indoctrination and preparing them for subsequent work in nature conservation in the broadest sense.

In order to provide the necessary basis for professional ecological knowledge, a modern teacher should be himself ecologically well prepared. Starting from the first semester where the "Introduction to the Specialty" is given and then in taking up individual questions of the conservation of nature in socioeconomic, psychological-pedagogical, general scientific and special subjects and ending with the small final subject "The Conservation of Nature" at the last course, it is possible to provide the necessary all-round ecological training for the future teachers. In the advanced VUZes, 400-500 training hours are given to such a system of continuous interdisciplinary ecological training. In addition, the students acquire the necessary practical skills in field exercises and in conservation squads.

The question of the conservation of nature is developing and ecological education is improving. For this reason, there is the important question of the corresponding periodical training and retraining of teachers on advanced training courses and in the teacher advanced training institutes.

10272
CSO: 1820/1

ENVIRONMENTAL PROTECTION 'SQUADS' DISCUSSED

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[Article by S. G. Mukhachev, assistant on the Chair for Chemical Cybernetics of the Kazan Chemical Engineering Institute: "Environmental Protection Squads"]

[Text] What Is An Environmental Protection Squad?

Indicatively, over the two decades of the existence of the movement, all the squads in our nation have been organized solely upon the initiative of the students themselves. Any attempts by the administration of the VUZes and other organizations to encourage the development of the squads or to propose that the squads carry out work not inherent to them have merely given rise to conflict. The most widespread reason for such conflicts has been the involvement of squad members in mass conservation projects, for example, landscaping. Each year the squads carry out a large number of propaganda, research and training measures, they publish articles, while groups of the intersquad "Preserve" detachment in 2 months apprehended several-score violators and a volunteer inspector squad member is equally effective in terms of the results of his work as, for example, a regular fish conservation inspector.

An environmental protection squad is an independent association. Its basic features are:

1) **Self-organization** or the independent planning of internal life, the constant creative search for new forms, methods and means of work contributing to a maximum manifestation and development of each member's initiative;

2) **Self-instruction**--every 2 or 3 years the membership of the squads is almost completely renewed and there are no organizations capable and ready to carry out their all-round training;

3) **A diverse content of the work**--a combining of operational, propaganda and scientific research work;

4) **Regularity**--a constant active aware participation by each member in common affairs ensured by the psychological situation in the collective;

5) **Contact** with analogous primary collectives for exchanging experience and coordinating actions in carrying out common programs.

Intrasquad Training

The students of the first and second courses arriving in a squad do not possess special conservation knowledge and skills. Here they acquire them through seminars (including intersquad), inspector training and the nature conservation sections under the faculties of social professions.

In certain squads virtually all the candidates study in these sections. And only after successfully passing an exam or a quiz before the squad's staff are they considered to be members. For example, at the Kazan Chemical Engineering Institute (TKhTI), the quiz and admission to membership are held on the "Squad Day." The inspector exercises conducted by the most experienced members have become an indispensable and traditional attribute of these days. The candidates should demonstrate the skills and abilities acquired during the year of training. In exercises conducted in a game form, inspection techniques are developed, the statements of various violations of conservation legislation are drawn up and situational tasks are carried out. All of this is carried out in accord with the traditional ritual and causes a lively response and emotional upsurge among all participants.

The training procedural sectors organized in many squads help to organize training, work out scenarios for the inspector exercises and select the necessary literature. However, their need for educational aids is extremely little satisfied.[1] Particularly those which reflect the unified programs for carrying out joint projects by different squads. This applies first of all to the work of the intersquad "Preserve" detachment, the Spruce Program, the organizing of preserves and expeditions of the Moscow squads under the Shot Program. For example, in all the squads training special detachments for working in the preserves, training is given on the general questions of preserve work and the specific jobs in the given preserve. The detachment members are immediately focused on the necessity of interdisciplinary work, that is, protecting the preserve territory, propagandizing the tasks of the preserve among the local population, and carrying out research upon the assignment of the scientific section. Participation in the Spruce Program requires different training. Here it is essential to master the methods of studying public opinion, the specific features of combating the illegal felling and trade in spruce trees and so forth. The members of the Fauna Program need, for example, rather profound knowledge in ornithology. All of this indicates how essential it is for the teams to have procedural aids which would generalize their joint experience.

The Importance of Educational Work

The educational work of the squads is assuming ever-greater significance, going beyond the squad work per se. The solutions found are taken up by other organizations. For example, the police and various public organizations have become involved in the Spruce Operations in many of the nation's cities. They can employ the work methods tested out by the squads.

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[1] The most complete aid "Metodicheskiye rekomendatsii po organizatsii prirodookhrannoy raboty sredi molodezhi" [Procedural Recommendations on Organizing Environmental Conservation Work Among the Youth] was published by the Tatar Republic Council of the All-Union Environmental Protection Association in Kazan in 1978.

The squad of the TKhTI, upon the request of the Komsomol committee, participated in working out a memorandum for the conservation of nature for the members of the SSO [?Student Construction Detachment]. Upon the initiative of squad member teachers, a plan is being worked out for interdisciplinary ecological training. As an experiment seminars have been held on the sociopolitical aspects of conservation. A course on the fundamentals of ecology has been included in the curriculum.

Particularly desirable is direct intervention into the training process by the squads of the technical VUZes which do not have chairs for environmental protection. These can organize public libraries for conservation literature and focused on the specialty of the VUZ as well as conduct public consultation for those desiring it. Such work is carried out at the TKhTI.

The Basic Functions of a Squad

At the seminars and conferences of the squads, it has repeatedly been emphasized that each area of activity makes a contribution to realizing the educational function of the squad.

Effective work to combat poaching helps to develop a new philosophy among the squad members themselves as it forces them to constantly test their convictions in word and deed in encountering specific violators, and discloses the true attitude toward the conservation of nature and the principledness of each. The social response to this work instills respect among the entire population in the conservation laws.

Propaganda work by the squad members influences not only themselves. It is quite apparent that to convince someone it is essential to be doubly convinced of one's truth, to skillfully use facts and examples and to have a sufficient understanding of those questions which are presented to the listeners. It is difficult to exaggerate the importance of propaganda for indoctrinating the people. Effective and active propaganda reaching each person is the key to solving ecological problems in a socialist society.

Research in a squad also has a dual purpose. In being of great importance for solving conservation questions, it at the same time teaches one to act in accord with the principles of conserving nature and in many VUZes proper attention is still not given to this.

Work in a squad (particularly scientific research) makes it possible to realize gaps in knowledge and develops a desire for self-education.

The good psychological situation in a squad creates the prerequisites for maximum self-expression. Due to the existence of a special "squad spirit" in it, the activities of the members assume an independent nature. In seeing the sincere interest of the squad members, the people around, primarily the students from the same VUZ, begin to reflect more profoundly over conservation problems and determine their attitude toward them. This is already an element of self-indoctrination and without arousing this it is impossible to form a communist ideology as a whole and not only ecological thinking.

Unsolved Problems

The squads are continuing to seek out organizational solutions. One of the most difficult problems is the coordinating of their activities which at times is done very unsatisfactorily.

The exchange of educational materials between the squads often becomes an unsolved problem. The number of squads is rising. At present, there are already around 70 of them. As a rule, they do not have their own physical plant and far from always can use those of their VUZ. For this reason, any educational method developed in a squad, before becoming available to the entire movement, undergoes a long and tortuous path even usually being written out longhand. The USSR Ministry of Higher and Secondary Specialized Education could assume the solving of these questions and oblige the editorial and publishing sections of the VUZes to assign a certain number of printer sheets for the needs of the squads.

Up to now in certain VUZes the squads have not been given any material support. The squad members are forced to go on raids and attend seminars at their own expense. This question could be partially resolved by establishing close contacts with the local councils of the environmental protection societies. Here help from the VUZ administrations is indispensable. But the administration does not always support the squad. One has merely to remember the case which occurred at the Donets State University. The university squad members experienced direct persecution by the dean who obviously felt that the squad's demand to punish an instructor from the biology faculty who had been caught poaching to be invalid. But due to the decisive support of the entire movement, he had to give way. One can only guess why the independence, social activeness and principledness of the squad members can encounter resistance. And where? In the very VUZ which should carry out the communist indoctrination of the students!

The Prospects of the Movement

It is time for all the squads to cooperate more actively with the rayon, oblast and republic councils of the environmental protection societies and to send to them the graduates which are most dedicated to the conservation cause.

At present, all society is interested in increasing the militancy of the mass conservation organizations. Certainly the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Additional Measures to Strengthen the Conservation of Nature and Improve the Utilization of Natural Resources" of 1 December 1978 mentioned the need to strengthen the environmental protection societies with skilled specialists. The VUZ graduates who have been schooled in the movement undoubtedly are such specialists.

10272
CSO: 1820/1

ENVIRONMENTAL EDUCATION ABROAD REVIEWED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 114-118

[Article by G. D. Shadrina, Junior Science Associate of the Group for Conservation Education at the Institute for Evolutionary Morphology and Animal Ecology in Moscow: "Ecological Education Abroad"]

[Text] After the 1977 Tbilisi International Conference, in all nations increased attention began to be paid to improving ecological education. Definite experience has been acquired and a familiarization with this helps in choosing the most progressive forms and methods for this type of education for our country.

On the eve of the conference, the UNESCO Secretariat conducted a world-wide survey on the state of ecological education. From an analysis of this material, in particular, it can be seen that a special course on environmental problems is given, for example, in Queensland University, Australia, not only in the natural science divisions, but also in the divisions of technical sciences, civil construction and architecture; at Dortmund University, West Germany, on the faculty of economic and social sciences; at Edinburgh University, Great Britain, on the chair of forestry and natural resources; at Auckland University, New Zealand, on the law faculty and so forth.

Special lectures on the conservation of nature and landscape management are given on the natural scientific and agricultural faculties at five GDR universities. The nation has worked out a draft curriculum for the subject "Socialist Agriculture and Environmental Protection" adopted for various VUZes.

In the CSSR, emphasis has been put on the training of engineers. This is justified by the fact that precisely these specialists more than others are involved in the transforming of nature. The Prague Engineering Institute has set up courses for environmental protection for construction engineers, chemists, forestry specialists as well as for managerial workers, scientific research institutes and design institutions. Many VUZes of the nation have graduate studies for the specialties: the technology for utilizing waste water, the utilization of forests, landscape management and so forth.

In the Netherlands, field engineers are trained on environmental questions in the agricultural and polytechnical institutions while specialists for working in design and administrative bodies involved in conservation are trained in universities.

Education in environmental questions in Great Britain has become a part of general education for all technical specialties. In recent years, the nation has established around 35 professional courses on city and rural planning, landscape architecture, civil engineering and environmental hygiene. In Great Britain, the situation is better than in other nations in finding jobs for environmental specialists. Some 42 percent of them are working in their specialty (in comparison with 30-35 percent of the physicists, chemists and biologists).

In the U.S. colleges and universities, in contrast to the British universities, there has been a tendency to integrate instruction on environmental questions on all chairs. A typical example could be Ohio State University which is the coordinating and programming center for the study of environmental problems. At the university, natural resources are studied on 25 courses which cover 10 departments. In other VUZes, on nonspecial faculties there is an interdisciplinary course on ecology which is included in the curriculums without harm to traditional education by reorganizing the educational process.

One should also note the American experiment of overseas studies for future specialists. Northern Illinois University provides seniors studying the problems of the environment and extracurricular education an opportunity to live and study for a year at Buckinghamshire College in Great Britain. At Cornell University, in the department of natural resources they train both foreign students as well as Americans for working abroad. In this department increased attention has been given to studying the international aspects of conservation.

Many colleges and universities award degrees. Michigan and Ohio State Universities in the United States offer the degree of Bachelor of Science, Master and Doctor of Science in Environmental Protection. Maine State University grants a Master of Pedagogical Sciences in the environmental area. Here also they train personnel for environmental training centers. In 74 pedagogical colleges in Great Britain, students receive a Bachelor's Degree with the right to teach environmental conservation in primary schools.

In the training of specialists on environmental problems, an important role has been assigned to improving skills. One of the most successful forms in the developed capitalist nations is the special training centers under universities. Lavalle University in Canada has achieved the greatest success on this level. Since 1968, it has been training and retraining broad specialists on an interdepartmental basis.

In Great Britain, there are specialized courses on the utilization and protection of the environment for specialists in this area as well as broadened courses for persons who have not received such an education previously. An example of the second type of courses would be the courses at London University open for everyone so desiring over the age of 18. This includes teachers, workers in technical professions and even housewives. The open university offers the students extensive material on the relationship of man and the environment. The problem is examined in two aspects: the effect of man on the environment and the forms of the reverse influence. The study of each of the parts is planned for a year. The annual course includes 30 evening lectures (once a week) as well as laboratory and field exercises.

In the United States, the so-called universities without walls have been active. These widely employ radio, television and other auxiliary means of instruction. They have

been organized by the Association of Experimental Colleges and Universities which brings together 34 American VUZes. The students are already employed specialists who desire to update their knowledge on environmental questions.

And unique form for improving skills exists at Dublin College in Ireland. The graduates of the machine building and architecture departments can return to college for 6 months in order to more intensely study environmental protection subjects.

However, the development of extended courses involving the leaving of employment is restricted in financial regards and for this reason in all countries morning, evening, correspondence and even 1- or 2-week courses have been most widely developed.

In examining the ways to improve the skills of specialists, one cannot help but note the opportunities which international cooperation provides in this regard. Thus, the International Madrid Educational Center, in addition to theoretical research, has organized courses lasting 10-20 days and sometimes 3 months on the basis of universities for retraining specialists in the conservation area considering the specific features of each Latin American country.

UNESCO and UNEP have given particular attention to the retraining of state officials and workers from various countries. Upon UNESCO initiative, in the developed nations each year courses are held for the post-graduate training of personnel, predominantly specialists from the developing nations. Among them one might mention the 11-month courses on the integrated study and rational use of natural resources at the universities of Paris, Montpellier and Toulouse in France, the 7-month courses for training in the area of soil science and plant biology at the universities of Granada and Seville in Spain, the 2-year courses for soil science and cartography at the University of Ghent in Belgium, the 10-month courses on the questions of ecosystem management at Dresden University in the GDR and others.

From 1977 through 1980, more than 10,000 industrial executives and governmental officials from 30 developing nations have undergone training at the program organized by UNEP together with Denmark and Sweden.

In conclusion we would emphasize that, regardless of the substantial achievements in organizing ecological education, many specialists in various regions of the world are still not sufficiently informed on the urgency and seriousness of environmental problems. Undoubtedly broadening and improving the ecological training of all specialists is an urgent and timely matter.

The Tbilisi Intergovernmental Conference emphasized that "in addition to special education in the environmental area, an interdisciplinary review of the basic problems involved in the relationship between man and the environment is essential for all students and not only for those studying natural and technical sciences, but also those who are concerned with social sciences and art, since the relationships between nature, technology and society determine society's development."

10272
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PROBLEMS OF DEALING WITH REDUNDANT, DISMISSED WORKERS

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 123-133

[Article by Candidate of Economic Sciences A. M. Dobrusin of the Kuybyshev Electrical Engineering Institute for Communications: "Work With the Personnel; The Cutback Order, the Hiring Order: Many Problems are Concealed Behind Them"]

[Text] Not Everything is Simple in Dismissal

We are ready to shake the firm hand of a director who without looking back or providing a way out reduces the personnel. In signing an order for dismissal, release or transfer, the leader thereby helps to increase the results of labor for those who remain at the enterprise. He has been prepared for this decision long before he signed. He met with the technical specialists, the economists, the personnel workers and, naturally, also with those who were to be let go....

Yes, this is precisely how it happens at the best enterprises.

At the Kuybyshev Synthetic Rubber Plant in Togliatti, one of the first in the oblast and in the sector to convert to the Shchekino method, the director, before signing the order, held a meeting for the experiment commission. A number of circumstances of dismissal were considered, primarily the material and technical aspect. For instance, a cutback in markers was possible because a mechanism had been installed which eliminated manual operations; a reduction in the number of repairmen for chemical equipment was in line since this was caused by the starting up of a hydraulic machine to clean the equipment and so forth. A similar system was adopted among neighbors including the Kuybyshevnefteorgsintez [Kuybyshev Petroleum Organic Synthesis] Production Association.

During the Tenth Five-Year Plan, as an annual average the nation developed and put into serial production 2,700 new types of equipment, devices, instruments and automation. Industry began operating 40,000 mechanized flow and automatic lines and 19,000 sections, shops and production lines were converted to full mechanization and automation.[1] The results of the reequipping were not long in coming. Almost 2 million persons have been moved from manual labor to mechanized alone.[2]

The curtailment of manual labor, in particular heavy physical labor, has become a primary state concern and one of the most important specific comprehensive programs.

The Kuybyshev workers were also among the initiators. The coordinating council which headed this work included representatives from the party, soviet, trade union and Komsomol bodies, activists from the scientific-technical societies, economists, statisticians and industrial specialists. The council worked out 17,000 organizational and technical measures designed for introduction in 1978-1985. As a result of implementing them over the last 3 years of the Tenth Five-Year Plan alone, the directors of the Kuybyshev associations signed the cutback orders for 8,500 persons and heavy manual labor was eliminated in 7,500 jobs. In 1981, there were plans to carry out a range of measures to mechanize the labor of 4,000 persons, to eliminate heavy physical labor for 1,600 and to free at least 2,800 workers for transfer to other areas. [3]

Thus, the cuback in worker personnel usually involves changes in production methods as well as the mechanization and automation of production processes. The new processes and mechanisms should be noticeably more productive than the previous ones. Obviously, this rule should be observed everywhere.

But is it?...

An instance comes to mind which occurred at the Kuybyshev Valve Plant. There two automatic lines were in operation with a total capacity of 5 million valves a year. The time had arrived for reconstruction. The technical specifications from the design institute arrived in the city on the Volga and the plant director got ready to issue the cutback order. But, having leafed through the papers, he was struck dumb as the number of workers planned to operate the new lines had been increased by seven persons. What was this, a paradox of the scientific and technical revolution? No, this had nothing to do with the scientific and technical revolution. Simply the indicators and criteria for evaluating the work of the designers and machine builders did not impede the output of equipment which was "new" in name only. For the new lines, productivity remained as before while the area required for installing them had increased by almost 1.5-fold and costs had almost doubled.

The following figures come to mind: during the Tenth Five-Year Plan, all machine building product increased annually by an average of 7 percent while the output of loading equipment directly making it possible to reduce manual labor rose by just 2 percent. [4] Now, in the llth Five-Year Plan the difficult task has been set of saving the labor of 1.5-2 million persons in the nation by 1985 by increasing the level of mechanization in materials handling, loading and warehousing work. [5]

For a more planned distribution and redistribution of the labor resources and for monitoring the effectiveness of their use, it is essential to establish a new indicator in the form of a limit on the number of employees. However, this standard is not completely observed by the production associations and enterprises. Thus, over the first half of 1980, the limitations on the size of the labor force were exceeded in the coal, food and meat industries. [6] In the speeches of the delegates of the 26th CPSU Congress it was pointed out that planning the size limit has run into a number of difficulties. For example, in Latvia and Moscow Oblast, an increase in the number of industrial-production personnel has been incorporated in the plans and new jobs are artificially created.

The release of manpower is a complex socioeconomic process. After the dismissal or cutback order, one must promptly prepare a hiring order.

Not Everything is Simple in Hiring...

An employee who has been released as a result of scientific and technical progress can find suitable employment at his own enterprise. But with the deepening of automation, not hundreds but rather many thousands will be released. The demand for additional workers arises not only at one's own, but also at hundreds of other enterprises. According to the data of a survey made not long ago by the RSFSR labor bodies, 67 percent of the new factories and plants were not provided with skilled workers in the basic professions. Consequently, the transfer of labor should be carried out not only within a given production collective. One can scarcely envisage a transfer to another sphere of activity only in the instance that every opportunity to utilize the employee at the given enterprise has been completely exhausted. Naturally, it is essential to consider personal interests and inclinations. Social needs must also be considered.

The 26th CPSU Congress posed the specific task of actively involving manpower which was surplus in a number of regions in developing the new territories of the nation. The congress particularly emphasized that the industrial development of new regions is important not only in the economic, but also in the social and political aspects. The production collectives arising there introduce a high level of labor and life and a new modern pace of life.

In 1977-1980, with the introduction of the normative method, 4,600 management workers were released at the enterprises of the USSR Ministry of Coal Industry, 10,300 at the USSR Ministry of Ferrous Metallurgy, 5,300 at the Ministry of Chemical and Petroleum Machine Building and 2,300 at the Ministry of Light Industry. On the basis of realizing the advantages of the Shchekino method, the USSR Ministry of Maritime Fleet released several thousand crew specialists and the average annual economic effect during the 1976-1980 period was over 2 million rubles.[7] In the Tenth Five-Year Plan, by increasing the level of the mechanization, automation and organization of production, by introducing progressive standards and methods for the organization of labor, the enterprises of the USSR Ministry of Agricultural Machine Building have annually freed around 30,000 workers.[8]

All our arguments would appear at best indelicate if, in welcoming the energetic leader who reduced and then hired new co-workers, we overlooked the freed worker himself and did not understand the state of a man who was forced to leave his collective against his will. The simplest way to understand the situation of the eliminated worker is to put oneself in his position. Here, we feel, one might quote an excerpt from the Hungarian newspaper NEPSZABADSAG: "It is not difficult...to explain the sense and goals of a regrouping of the labor force and to give the appropriate order for this. But again it is extremely important to consider that the concept of the 'labor force' is not a dead statistical category. The regrouping involves the fates of specific individuals and entire families. Some must bid farewell to their customary job and sometimes even the enterprise. Of course, in a socialist society a person will not be unemployed, but somewhere in one's soul it is felt that an injustice has been done in proposing a transfer to another shop, to another plant, to another institution. The clear and well-thought-out activities of the communists will prevent an insult from arising and growing."[9]

Thus, the task is not merely to release a worker from one or another enterprise, but also to hire, to place him in a new job and here to follow up and see that he has not suffered any socioeconomic loss.

It is inacceptable that the labor force released in the mechanization process be switched to those types of jobs which have still not been provided with equipment. Also socially unacceptable is the path of switching released workers for maintaining the previous pay level to new jobs with similar (injurious and heavy) working conditions. Such a form for shifting labor should have an extremely limited nature. "It would be a good socialism which perpetuated professional wheelbarrow pushers!" wrote F. Engels.[10]

We can scarcely accept the proposal of G. Kh. Popov which has been made in mass publications of sending the released workers who do not desire to leave their small city with a not acutely felt manpower shortage to work in the streets, at vegetable bases or to help the villages. We feel that not every director of a vegetable base or city park would raise a hand to make a skilled equipment operator into a manual laborer in the streets or to sort potatoes. Incidentally, Shchekino, the home of the famous experiment, is precisely such a small city. According to the data of the USSR Goskomtrud [State Committee for Labor and Social Problems], at the Shchekino Chemical Combine the proportional amount of equipment workers in the total number of released employees was 23.1 percent, for machinists and welders 11.7, for machine and pump operators 12.5 percent, for repairmen of monitoring and metering equipment and for automation it was 11.1 percent, for laboratory technicians and inspectors 11.2 percent and so forth. Would it be possible to send this army of skilled workers to landscaping or street sweeping until they have found acceptable jobs? Who would issue such an order? Is not the professional training of these workers worth something in calmly transferring them to cut off branches or pick through vegetables?

Repulsion and attraction, cutback and hiring, release and job placement--these processes do not descend on a director unexpectedly, as a bolt out of the blue. The plan contains indicators for labor and social development. In this area the director has compulsory assistants in the ministry. In accord with the Standard Regulation on the Vocational Training of Workers on the Job these help ensure that the worker skill level conforms to the requirements of production, to the tasks of increasing its efficiency and work quality and the social development of the collective; they help anticipate changes in the vocational-skill structure of the workers, to forecast them and on this basis determine the demand for the training and retraining of the personnel. The ministries and departments work out and properly establish for the subordinate associations, enterprises and organizations 5-year and annual quotas for improving worker skills and so forth. Research is carried out on a scientific basis and recommendations are elaborated to improve vocational training. This is done so that each person can have a notion of his labor career for many years to come. In no instance can or should he be in such a hopeless situation to agree to go to a vegetable base (this in no way reduces the importance of labor at this base, rather it is merely a question of workers of a different skill).

Naturally, not all the eliminated workers change their profession and for many of them the forecast and the calculation make it possible to hold a job in the former specialty at a neighboring plant, in a new shop of the same enterprise and so forth. But a definite number of the workers let go will change their profession and will become part of a retraining order.

And here a new question arises: What director would put his signature to this order, the one who dismissed the worker or who has hired him? Which of them should find a job for the released worker?

A director who has signed the dismissal order must repeatedly meet with his legal advisor. The problem is that he should not only reduce the number of workers, but also find a job for them, that is, engage in activities which, if one follows clear thinking, is within the competence of the bodies which should be engaged in the redistribution of labor resources, for example, the local soviets. Only with an intraproduction shift of the labor force can the enterprise itself determine the most effective ways for utilizing the worker.

Often an already prepared cutback order is pigeon-holed because of the job placement problem. Thus, even at the start of the experiment at the Shchekino Chemical Combine, it would have been possible to reduce the number of industrial-production personnel by 260 persons, but in fact only 100 were let go.[11] The workers for whom jobs could not be found remained at the enterprise although they were essentially superfluous.

Until recently, the job placement and public information bureaus have played a definite role in the redistribution of labor resources. Their activities have been rather effective as the process of adaptation and retaining of the released workers in new jobs occurred more quickly, time was saved in job placement, enterprise expenditures were reduced in retraining the labor force and so forth. At the same time, these bureaus as yet can do little for the workers released under the impact of scientific and technical progress. The production associations (enterprises) have been the initiators in establishing cost accounting relations with them and, as practice indicates, not all the associations and enterprises maintain constant contacts with the bureaus. They do not inform them of vacancies, the number of released workers and so forth.

We feel that all the work in finding jobs for the released workers should be assumed by the city labor departments set up under the executive committees of the soviets. Following the example of the Muscovites, it would be advisable that the labor departments and planning commissions worked out a comprehensive specific program for the given region which would be for "labor resources" and the aim of which would be to ensure the effective release and placement of the workers.

It is not easy to resolve the question of who should retrain a released worker. The director would be correct if he refrained from a retraining order. The freed labor force leaves the enterprise and it makes no sense to bear financial expenditures and assume the organizational troubles for retraining. Why should another director live off him? Undoubtedly, the retraining should be carried out by the enterprises hiring the released manpower.

Then the order has been prepared for the hiring of the let-go worker and for including him among those to be retrained. The director is again perplexed as how can he encourage the worker who has been tranferred to him and pay him in retraining? Naturally, the personnel released as a result of scientific and technical progress should not lose in wages. They are not "loafers" and the cutback has been made for objective reasons. They have realized the social necessity for their redistribution. In this instance can one really remain indifferent to their personal interests?

The director would be happy to satisfy the material personal incentive of the workers, but there is the question of how to provide a material incentive for workers who have been transferred to new jobs? The labor legislation on the given question is virtually limited to a decree on compensation and guarantees in transfer, rehiring and sending

to work in other localities; this was adopted 50 years ago, in 1931. On 27 February 1970, the decree of the USSR Council of Ministers was approved "On Benefits and Advantages for Workers Released Because of an Improvement and Cost Reduction of the Management Personnel," while for establishing the procedure for hiring and sending personnel to the Volga Motor Vehicle Plant during the same year there was a special letter of the USSR Goskomtrud and the USSR Ministry of Automotive Industry.

The system of material incentives for the released workers, for their retraining and transfer needs further systematization. A director, in signing the retraining order, should specify those who worked at the enterprise, were released, assigned to a new job and for this reason sent for retraining from those who transferred from other enterprises, particularly from nonrelated sectors. The former are familiar, as a rule, with the material bases of the given production and after a short period of time can be incorporated in the labor process. The retraining of the latter takes a longer time. But the director cannot make such a differentiation. On the one hand, the principles and amounts of material incentive have been set as uniform; on the other, the director is restricted by the fact that he is putting his workers under unequal conditions when he signs an order sending them to courses or training centers outside the enterprise. The amount of material incentive depends upon whether or not the person worked prior to this at the given enterprise. For the period of instruction, an "insider" keeps his wage rate (salary) obtained at the job prior to being sent to the courses while the "outsider" is paid only one-half the rate (salary) set for the profession which the worker is being trained to take over.

The leader would feel more confident if he knew that the employee who had been transferred to his enterprise would receive the same rights as a worker who had been employed here previously and had acquired a second specialty. Moreover, a person who has transferred to a new enterprise and left his residence with his family should feel the closer attention of the collective (the one-shot assistance in moving, the maintaining of a continuous length of employment and the payment for years worked, that is, the 13th-month salary, the providing of housing with certain advantages on the waiting list and so forth).

Thus, the orders to dismiss and hire released workers are signed. What must be done so that this process is carried out effectively and at optimum times and in order to unfailingly consider the interests of the persons cut back? It must be remembered that the elimination of manual, unskilled, heavy physical labor and the movement of the labor force are not only an economic problem, but also a serious social one. Consequently, it is essential to work out an ordered, smooth, econmically and socially effective system for the release and job placement of personnel. Possibly this system should assume the form of an order (a regulation, decree, decision or instruction) of the USSR Goskomtrud with the co-authors of the USSR Gosplan, the USSR Committee for Science and Technology, the USSR Ministry of Finances and the other ministries and departments.

FOOTNOTES

1 "Narodnoye khozyaystvo SSSR v 1980 godu" [The USSR National Economy in 1980], Statistical Annual, Moscow, 1981, pp 101, 103, 104.

2 EKONOMICHESKAYA GAZETA, No 28, 1980, p 10; A. I. Baybakov, "Povysheniye urovnya upravleniya truda" [Improving the Level of Labor Management], Moscow, 1980, p 109.

3 VOLZHSKAYA KOMMUNA, 13 May 1981.

4 PRAVDA, 20 April 1981.

5 "Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, 1981, p 107.

6 PRAVDA, 18 August 1980.

7 SOTSIALISTICHESKIY TRUD, No 5, 1981, p 68.

8 Ibid., p 53.

9 Quoted in: PRAVDA, 15 December 1979.

10 K. Marx and F. Engels, "Soch." [Works], Vol 20, p 206.

11 "Osnovnyye problemy ratsional'nogo ispol'zovaniya trudovykh resersov v SSSR" [Basic Problems in the Rational Utilization of Labor Resources in the USSR], Moscow, 1971, p 246.

10272
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MORE EFFICIENT USE OF MANAGERIAL TIME NEEDED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 134-140

[Article by Candidate of Economic Sciences F. Ye. Udalov, Chief of the Section for the Scientific Organization of Labor in Gorkiy: "The Leader's Race Against Time"]

[Text] The shortage of working time is one of the main problems of labor in management. Characteristic of the work of a leader who is short of time to solve production questions are:

1) A lack of planning in the use of working time and a poor ranking of priorities;

2) Nervousness and confusion in action;

3) Impatience in the taking of decisions and in relations with equals and subordinates;

4) An insufficient level of the division of management labor in the subdivisions and a low degree of delegating functions and responsibility to subordinates;

5) A lack of order at the work area;

6) Surplus and unsystematic correspondence on the desk;

7) A following of the principle of "what I have not succeeded in doing on the job I will do at home where it is calmer";

8) A lack of time for recreation, poor sleeping and consequently a bad mood on the next day.

Thus, the leader falls into a vicious circle and feels that there is virtually no way to escape from it. In such a situation there can be no question of the future development of the subdivisions or an improving in the organization of his own labor and the labor of subordinates. The leaders are turned into purely operational employees who settle the constantly rising minor and nonfundamental questions which are always in oversupply. If such a leader is asked why he is not concerned with the fundamental problems, he would reply: "Where do I have any time for this, don't you really see what conditions I work under? I do not even have enough time for simple questions and here you are asking about the bigger issues."

The problem is that the leader is sincerely convinced of his correctness. He even does not reflect whether all the decisions which he will make today and whether all the questions which he will examine should reach him, whether the system for the handling of information has been correctly organized and just how good is the incoming information. In other words, the leader does not endeavor to look at his activities from outside in order to judge whether his work has been rationally organized.

I say all of this because one of the leaders questioned by us from various managerial levels did not even attempt to analyze his working time, he could say nothing about how he planned to reorganize his activities in order to escape from the solving of minor, nonfundamental questions, having turned them over to the inferior managerial levels. No one could imagine photographing his working day, and when at our request one of the leaders for a week did this photography, it was of such poor quality that it was simply impossible to draw any conclusions on the basis of it. In the meanwhile a study of the actual structure of working time expenditures, its distribution by managerial functions, in terms of the degree of the urgency of the decisions being made and in terms of the form of carrying out the decisions are a most important prerequisite for improving the production management system. Even with a limited number of observations, it makes it possible to point out the main shortcomings inherent to a section, to a shop or enterprise.

You are Summoned....

The research conducted on the use of working time by the leaders of shops, sections and sectors at a number of machine building enterprises showed that their daily time fund is divided into a large number of brief segments (fragments) (see the table).

Table

Structure of Average Working Day for Leaders by the Duration of Its Component Segments

Length of Period in Minutes	Shop Chiefs		Section Chiefs		Foremen of Production Sections	
	No. of segments	%	No. of segments	%	No. of segments	%
To 5	55	80.3	29	69.0	59	69.6
6-10	4	5.8	3	7.14	15	17.7
11-20	3	4.4	3	7.14	7.7	9.0
21-30	2	2.9	1	2.39	1.1	1.3
31-60	3.5	5.1	5	11.94	1.5	1.8
Over 60	1	1.5	1	2.39	0.5	0.6
Total	68.5	100	42	100	84.8	100

A predominant share of the fragments does not exceed 5 minutes and this shows the simplicity of the problems being solved and that they have been frequently repeated in the past. It can also be seen that the highest proportional amount of time segments up to 5 minutes is found among the shop chiefs. Such a situation is alarming as the shop leader decides the most insignificant production questions. Moreover, among the shop leaders there is a very high number of fragments lasting less than 1 minute. This is 1.4-fold more than among the section chiefs and 3.4-fold more than among the foremen of the production sections. Constant distractions, the signing of various papers, telephone calls initiated by oneself as well as calls from other subdivisions, confusion, the shop service workers who crowd the office and who have come to get approval for questions which, as analysis has shown, they themselves could solve with equal success--this is what the workday of a shop chief consists of. The frequent change of actions and the unsystematicness of execution cause nervousness in the leaders and since the shortest time intervals occur basically at the start of the workday, nervousness lasts until the shift's end.

The average length of the working day, according to the data of our research, is: 9.4 hours for the shop chiefs, 8.2 hours for the section chiefs and 8.7 hours for the foremen. The working time efficiency reaches, respectively, 0.71, 0.92 and 0.96. Consequently, the shop chiefs lose here, too.

During work time the shop chiefs also have the shortest activities and these are mainly telephone calls (there are 32 of them, or around 60 percent of the total number of activities lasting up to 5 minutes). The average length of a shop chief's telephone call is a little more than 1 minute. For the section leaders there are 2- or 3-fold less telephone calls while the foremen have 4- or 5-fold less.

There is a very noticeable difference in the number of telephone calls for the foremen of the preparatory and assembly shops. While the former have 3 calls as an average per day, the latter have 14. In contrast to the shop chiefs, a foreman speaks longer over the telephone, 1.9 minutes against 1.05.

Having examined the organizational aspect, it is also essential to consider the technical one. At a majority of the enterprises surveyed by us, the telephone equipment through the plant exchange does not meet modern requirements. There are long time expenditures on dialing; one must remember the number or look them up in books. When the line is busy or the exchange is overloaded, the psychological stress grows. In such instances, the leaders, particularly the shop chiefs, show impatience and get nervous.

Autonomous communications are essential in each large internal subdivision, particularly in the basic production shops. Communications with the technical departments of the enterprises are also growing.

Our measurements showed that the dialing of a four-digit number through the automatic exchange requires 6-8-fold more time than sending a call through the autonomous communications. Moreover, if the leader, having dialed the number, hears the busy signal, then he almost always must either immediately or 3-5 seconds later redial the number for he is not certain that the automatic exchange has worked correctly. In this instance, 15-18 seconds are spent on the call and with the redialing 24-27 seconds while with the triple dialing and subsequent search for another near telephone number of the required person in the telephone book and the dialing of this, 40-45 seconds.

Our calculations have shown that the average daily savings of time for shop leaders in installing autonomous communications within the subdivisions and with certain external subscribers of the shop will be up to 30 minutes of net time. It is also essential to consider the positive psychological effect. The leader knows that he can always contact the necessary individual and that this contact is dependable. The direct surveys of the work areas of leaders of different levels and a questionnaire have shown that the individual switchboards and call devices are found only in 38.6 percent of those surveyed.

Sitters and Waiters

Observations have established that the shop chiefs conduct and participate, upon the invitation of the superior leadership, in 2.7 meetings a day with an average length of 1 meeting of 52 minutes. Consequently, the shop leaders spend 140 minutes on all types of meetings or 25 percent of the average length of the workday.

The foremen of production sections attend an average of 1.3 meetings during a day. Here, upon their own initiative, they hold virtually no meetings. The average length of one meeting for the foremen is 45 minutes while the average daily time expenditures for these purposes equal 8.4 percent. We have estimated that as an average 29 persons are present at a plant-level meeting and the average participation factor is 0.56 and the average length is 2 hours. Consequently, it would be possible not to invite around 12 persons to a meeting or save 24 hours of working time at each meeting.

An important element in the activities of leaders is the coordinating and taking of decisions with the superior leadership. As an example of the organization of receiving among superior leaders, one might give the overheard dialogue. This was at the start of the workday.

"When can you see me?" asked a worker of one of the leaders.

"Catch me after lunch," came the reply. Such a reply is scarcely satisfactory. After lunch is a state of complete ambiguity for a subordinate. Is it not for this reason that we can frequently see in the waiting rooms of industrial enterprises groups of persons who are whiling their time while waiting to be seen? We would not accuse them of the inability to plan their working time or the leaders of the inability to save the working time of subordinates. Let us examine the reasons for this phenomenon. There are at least two of them. The first is an objective one and consists in the fact that along with an increased production volume and greater complexity of the products, there has also been a growing load on the managers who are forced to work more intensely and often do not keep within their time limits. The second reason involves the inertia of the existing forms and methods of management which have been used for years and sometimes decades and which have basically provided satisfactory results but totally do not conform to the changed conditions of today's production.

According to the Plan

Undoubtedly, elements of planning must be incorporated in the organizing of office visits. It has been established that very often the employees arrive for an appointment, to put it mildly, unprepared, with poor quality information and, most interestingly, do not even feel particularly to blame for this. Obviously, the principle is at work:

"I have waited for a long time for you and now take a look." And the leader takes a look instead of showing him the door.

Here, for example, are the quality indicators for information received by the shop heads: 22 percent of the total volume was unreviewed, 15 percent was incomplete, 7 percent was out of date and 9 percent was unreliable. Much poor quality information is also forwarded to the superior levels of enterprise management. In addition, the leaders often must review questions which should be settled on other management levels. For the shop chiefs, the proportional amount of such questions averages 30 percent.

The experiment conducted by us showed that the quality characteristics of the information forwarded by the leaders is significantly increased and the time for taking decisions is reduced sometimes by several-fold if each subordinate is previously put within certain limits, that is, he is restricted to a predetermined time during which he should take the decision for the leader. In other words, having received a limited amount of time, he must first himself model the process of deciding and provide ways out of the situations which can arise. Understandably, in the given case, everything not relating to the question is noticed ahead of time and attention can be concentrated on the essence of the problem.

In organizational terms it is very easy to control office visits using the proposed method. The day before (and possibly at a different time, not just on the day of the visit) a secretary using a special form draws up a list of persons who wish an appointment. In addition to the name, place of work and position held, the list gives the question for review and the time, in the opinion of the requester, needed for taking a decision. The superior leader, in looking through the list, has the right to change this time and the requester is informed of this.

A questioning of more than 200 middle-level leaders at six industrial enterprises showed unanimous approval of the proposed method for appointments by the leaders of the superior enterprise management level.

For a number of years, we have carefully studied the time expenditures by middle-level leaders in appointments with the leadership. We have studied more than 250 appointments of 120 leaders, both upon the initiative of the persons seeking the appointment and upon the invitation of the superior leaders. The following structure of expenditures was obtained: 9,780 minutes waiting (in the waiting room or office); 1,980 minutes of net time for decision taking; 11,760 minutes total expenditures. Consequently, 83.2 percent of the time is wasted. With the ideal functioning of the appointment system, at each of them the savings would be more than 39 minutes. Also of important significance is the purely psychyological effect expressed chiefly in the efficiency of the appointment.

The survey data for a number of large industrial enterprises have shown, for example, that the number of persons visiting the administration during the workday averages 215 persons: the director is visited by 26 persons; his deputies by 66; the chief engineer by 69; 16 persons receive answers in the office. Here they have not counted the persons invited to meetings as well as employees urgently summoned by the enterprise leadership. The flow of visitors to the leadership is unjustifiably great and any system is lacking here.

We have described just three points in the activities of leaders--telephone calls, meetings and visitor appointments. The potential savings of time at them is great. And what if we analyze all activities as a whole? The effect is even hard to judge. It is undoubtedly enormous.

10272
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IDEAL TRAITS OF FOREMEN DISCUSSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 141-144

[Article by N. B. Yegay, Chief Engineer of the Plant for Reinforced Concrete Products, the Settlement of Verkhnedneprovskiy in Smolensk Oblast: "The Authority of a Foreman (From the Leader's Notebook)"]

[Text] What is an intelligent foreman? For any production workers, such a question does not seem strange and we would hear many answers to it, sometimes contradictory ones. In one way or another, they would mention the foreman's performance of his duties. How many are there? One might mention more than a score. Many years are required for the forman to begin to "fill" his position.

It Is Difficult to Learn by Words

At the same time, a foreman is usually a young specialist who has completed a technical school or an institute. He intends to work in this job for a year or two while expecting, naturally, advancement up the ladder, without going particularly into any of the duties prescribed him, but rather acting from the principle of "life itself will show." But life shows that today his subordinate workers are standing idle due to malfunctioning equipment and tomorrow because of a shortage of materials. The day after something may happen in the family of an essential machine tool operator and he, the foreman, must settle the family conflict in order to return to the shop the worker who has caused the plan to "get hot."

Over many years of contact with foremen, I have concluded that it is impossible to teach them anything in words either demanding, threatening, urging or obliging. It is essential to speak with them aptly and concretely, to propose reasonable and accessible solutions and to back up one's calculations with specific figures. The main thing that all of this can be established by personal contact and concern.

A foreman, in contrast to other leaders, best knows the definite production proceses during which unforeseen and unexpected situation constantly arise. These must be resolved quickly and positively, without evoking injury, miscomprehension or confusion in the people.

There are more than enough general recommendations on how to become an intelligent foreman, but only a few specific ones. In various years, I have noted down the ways of the best foremen. Their experience has not failed in practice.

The Rational Style of a Foreman

His workday starts with a walk around the section. In his hands is a notebook where he jots down data on the available materials, tools and attachments. Here also are comments on worker violations of the production conditions, safety equipment and the adopted measures.

It is also essential to write down questions which the workers have asked at meetings and simply in the work process. The effectiveness of such a note is that it makes it possible to carry out the requests of the workers on a methodical and planned basis, to respond to their comments. Here there must be the same punctuality as in turning in orders to the bookkeeper. The prompt receiving of special clothing and tools by the worker is also a concern of the foreman.

If a withholding has been made from a worker's wages, and he cannot understand the reasons, the foreman himself investigates the problem at the bookkeeping office, with the timekeeper or rate setter, he himself informs the worker of the mistake or explains that this has been correct. Such an approach eases the job of the bookkeepers and rate setters, it saves worker time and mitigates conflict situations.

The information available to the workers is a most important factor and for this reason the foreman in any form (in a memorandum or in a personal talk) provides information about the results of the previous workday and the positive and negative facts spotted by him. Once a week he analyzes the work of the brigades in order to effectively adjust the quotas for the following week considering the lag, if there is such. A total of three tasks can be set for a brigade: the fulfillment of the output rates with good product quality, the observance of production and labor discipline, activeness in difficult situations in the life of the section. Primacy must always be given to that brigade which has achieved possibly not the best results, but under less favorable conditions than the other brigades.

At the beginning of the month, it is essential to give the workers the output data for each man and the fulfillment of the quotas. On the 20-25th of the current month, the foreman assembles the brigades and informs them of the state of affairs in the section.

In the event of not completing the basic work, the foreman always has additional work in reserve, that is, jobs which should be performed one way or another, but later on. Such an approach makes it possible to maintain worker earnings on a definite level and work without overexpending the wage fund.

Mood and Attitude

There are many energetic foremen who know everything about their production. But today, this is not enough. An intelligent foreman has a group of like-thinkers in his subdivision. They are the backbone of the collective who understand the leader's ultimate aims and support him in every possible way. Far from anyone can organize such a group. It happens that there are people who seemingly work with enthusiasm and support the foreman, but they are basically guided by a material incentive and a desire to earn more. It is a completely different thing when the workers view good earnings as one of the consequences of achieving the collective's goals and are ready to help in any difficult situation.

A foreman who has been able to organize a close-knit and balanced collective is indisputably fortunate and can say confidently: "My mood depends upon the mood of subordinates."

The mood or more accurately the attitude of a young specialist who is a section foreman often has completely different sources. This may be the daily confusion and running first to look for electricians or mechanics to repair nonworking equipment or a desire to supply one's subdivision with material-technical resources and additional workers.

A young, still not "broken in" foreman must more often encounter "irreplacable" specialists who are not very susceptible to explanations and persuasion, who are not very desirous to participate in unplanned work and demand a great deal "as compensation" for their efforts.

The attitude depends also upon the foreman's direct leaders who are inclined to rebukes and in the presence of the workers. In turn, the workers, in noting such violations of business ethics, also begin to put off all the blame onto the foreman, even in those instances when they have made the error.

The mood of an experienced foreman who knows his value is based upon the mood of the collective in which he has many like-thinkers. The attitude of a young foreman is shaped depending upon external factors among which the main ones are how the shop leadership comments and values him, how the services of the chief power engineer, the chief mechanical engineer, material-technical supply and transport operate....

A foreman who has authority among the enterprise leaders is, however, a quite rare phenomenon since, in the first place, there are many foremen and, secondly, they themselves are the forgers of their fate.... In recognizing in words the role of the foreman as the central figure in production, the leaders defer and defer the solution to his problems. And there are many of them.

10272
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PROS, CONS OF FLEXTIME REVIEWED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 144-150

[Article by Candidate of Economic Sciences P. G. Klivets from the Dnepropetrovsk State University: "Flexible Working Time"]

[Text] **The morning.** When, finally, will the children realize that in the morning everything must be done quickly--washing, hair combing and dressing? They must be taken by the hand, shaken and shouted at. Then tears and pouts appear. Both the children and myself are upset and our nerves are taut. It is a good thing they do not have to go far.

Finally, the children are "out of the way." You just squeeze onto the third bus. You are late. A rapid walk, then a light trot developing into a gallop.... In a sprinter's burst I dash toward the entrance as if it were the finish line. But the finish is still ahead, I must reach the office. There is my desk. I plop into the chair.... I can catch my breath, comb my hair and put myself in order.

Midday. How is the child, back from school? I must call.... Yes, out of hunger I had completely forgotten: on Saturday I did not have time to pay the bill and pick up things at the dry cleaners. Something must be done. It is ill-advised to ask the chief for a second running as yesterday I had to slip off to the beauty parlor and to the school supply store. I asked my colleague at work: "If they ask for me, I am next door...." Having agreed, I make my way carefully, like a mountain climber over an abyss, toward the hallway. Incidentally, one could also leave putting up a bold front.

The end of work. At the whistle I am already back on the street. "What are you in line for? You are behind me, stay behind this citizen and I will be right over there.... What are they selling here? No, I will not wait...." I still have to pick up my child at the extended day school....

Probably this picture is familiar to any woman. The farther we go, the faster the pendulum of our daily existence swings. Where is a way out, how to help us, primarily the working mothers? Specific ways have been pointed out in the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures to Strengthen State Assistance to Families Having Children." Among them is the establishing of conditions for the work of an incomplete workday or week, for work at home and, finally, a transition to a flexible work schedule (SGR).

What is flexible working time? The worker himself plans the beginning and end of the workday and the time of the lunch break. Here a stipulated standard should be worked. Work can start from 0700 to 1000 hours and end from 1600 to 1800 hours. Within certain hours, from 1000 to 1200 and from 1400 to 1600 hours everyone should be at his desk. This is the so-called contact time. Each person can shorten any workday by 1 or 2 hours and in so doing becomes a debtor. The time taken up in debt must be worked off in the next few days.

Our nation has already acquired experience in using the SGR. The flexible schedule was introduced for the first time at the shale refinery imeni V. I. Lenin in Kokhtla-Yarva in Estonia and later at a number of labor collectives in Moscow, Sverdlovsk, Irkutsk and Novosibirsk. However, the idea of the SGR assumed broad familiarity only after it was discussed on the pages of LITERATURNAYA GAZETA in 1978-1979. New supporters of the SGR have appeared, including the leadership of the Leningrad VNII Elektrostandart [All-Union Scientific Research Institute for Standard Electrical Equipment]. Here initially 13 percent of the employees converted to the new operating conditions and because of this alone the working time losses were reduced by 1.7-fold for the institute. Productivity rose for the technical executors, in blueprint copying work and the number of designer mistakes was reduced by one-third. It was more difficult to determine the labor productivity of the designers and researchers, however here as well the time for carrying out the assignments was reduced with a fixed amount of work and number of employees.

There were also positive unexpected results. For example, the reduction in working time losses as a consequence of sicknesses. Thus, the sickness rate for men who virtually do not take sick leave for tending infants declined by almost 3-fold. The effect of the new work schedule was felt here in the fact that an opportunity appeared to promptly visit the doctor or drugstore and to regulate one's working hours in accord with how one felt.

The socioeconomic effectiveness of the SGR at the VNII Elektrostandart is apparent and it merely remains to add that it was backed up by organizational and technical conditions for control and accounting. Mechanical clocks were installed which recorded the arrival and departure from the job and a record was kept also in the logs in the subdivisions and by the guard.

Control and accounting were also well organized at the Dnepropetrovsk Dneprogiproshakht [Dnepropetrovsk Mine Design] Institute. Here the SGR has been in effect since the middle of 1978, and great indoctrinational and organizational work, preceded its introduction. Not only Soviet, but also foreign experience was studied and for this translated literature was ordered. It turned out that the main thing in the SGR is the ensuring of dependable control. It is essential to establish operational accounting of the time spent by each worker on the job, and one cannot rely exclusively on the conscientiousness of the co-workers or follow the path of turning the leader into a timekeeper. Dneprogiproshakht went further than the predecessors, seeking the aid of electronics.

At the entrance to the institute, automatic gates were installed similar to those we see in the subway. Only not a coin is inserted into the slot, but rather a special pass or slug on which is coded the worker's number. The photocells "read" this and transmit the information to a computer in the memory of which is marked the arrival and

departure times. The computer processes and each day puts out a summary report of the time worked by the co-workers for each subdivision. The summary prints out the code number, the last name, the entry and exit time, the overwork or shortwork for the past day in hours and minutes. Overwork is not considered further, but shortwork is kept in a running total from the start of the week or month. The summary contains a "local trips" section which makes it possible to take into account forced leaves from work for production reasons to other institutions and organizations. For recording them, the chief of each subdivision has two or three trip slugs. The co-worker must put two slugs, his own and the trip, in the gate.

Here are fragments from the working time accounting summary for the section of mining mechanics and equipment for 26 June 1981. The chief production engineer of the section V. V. Nikolaychik arrived at 0702 hours, he came out to the passageway at 1050 hours, he returned at 1357 hours and left the institute at 1705 hours. The computer noted Nikilaychik's absence on a local trip from 1050 hours to 1357 hours with a total length of 2 hours 7 minutes. We would point out that the computer automatically excluded 1 hour from the trip time as this was also the time of the lunch break. On that day Nikolaychik worked 38 extra minutes, but he will be unable to use this time. Extrawork, we should recall, is accounted for, but is not returned: the workday for engineers and technicians is not normed. In the summary for the following workday, 29 June, these 38 minutes are not counted, but there one did find the 1 hour and 10 minutes which had not been worked by the section chief A. I. Udovichenko. On 30 June, he worked out this time fully and even worked a little extra, but this was not recorded in the summary for 1 July.

It must be emphasized that with such a system, all nonofficial affairs are removed outside working time. In the same summary for 26 June, we find the line: The group leader A. S. Gogol' arrived at 0702 hours, at 0809 hours he went out, at 0813 hours he returned, at 0914 hours he went out, at 0918 hours he returned and so forth. What was up here? It turns out that the institute prohibits smoking. For confirmed smokers, a room has been set aside located outside the passage. If you want to smoke, you must go through the gates but the time of the smoking break is subtracted from the working time budget. In looking at the summaries, you will note smoking breaks of 10-15 minutes, and over the day they add up to an hour. Here is something for smokers and opponents of the SGR to think about.

Now a word about the opponents of the flexible schedule. Among them are vacillators and uncertain persons, but there are also active and militant ones. Let us start with those who in principle are in favor of the SGR, but have complaints against certain organizational aspects. For example, why is the extra time worked not counted? First of all, no one requires extra time or overtime. If one considers extra time, then ultimately one may reach the idea that this should be paid for as overtime. Or even bring action against the administration as just look, even the computer has recorded that I constantly work extra time. . Here it is wise to remember that the SGR is used virtually only for engineers and technicians for whom the possibility of extra work comprises the basis of the concept of an unnormed workday and for which longer leave is provided. Finally, we could consciously work an extra 40-60 minutes every day in order by the end of the week to accumulate 3 or 4 hours and even an entire day, thereby making a hash of Friday work.

The next, more serious flaw is in the insufficiently thought out system of accounting and control. The pioneers, in introducing SGR, basically did the accounting by hand.

The leader recorded the arrival and departure times in a log. In some places they introduced a double control with the same log being kept by the guard at the gate. At the Melitopol'kholodmash [Melitopol Refrigeration Equipment] Production Association, the experience of which was described by PRAVDA on 3 December 1978, precisely the complexity of accounting is an unsolved problem. Here the intention to change the time of starting work must be mentioned the day before. Then the chief issues a special insert to the pass which provides the right to come and leave freely.

The automated gates also have their shortcomings. They are not sufficiently reliable, they malfunction and, finally, they can be "fooled." For example, the Dnepropetrovsk Dneproshina [Dnepr Tire] Association does not use the SGR, but the arrival and departure of the employees are recorded by an automatic serially-produced Kolkhida gate. There were "smart alecks" from among the late-comers who glued up the punched openings in the pass, thereby escaping punishment. There were also several such instances at Dneprogiproshakht. As for tricks with the passes, now a rather simple method of combating them has been found. The reliability of the accounting system has been increased and this was harder to do. But the people who use SGR at their enterprises are aware of this. Another group of opponents knows less about the SGR and possibly this explains their categorical opinions.

The leitmotiv of the opponents is that SGR leads to a collapse of discipline. In the course of the debate in LITERATURNAYA GAZETA it was even written that "SGR is a schedule for the negligent and lazy who are not sincerely concerned with the job."

I spoke with the leaders of the major Dnepropetrovsk institutes and virtually all of them were against the idea of the SGR and argued against introducing a flexible schedule. Of particular interest was an establishing of the opinion about SGR among the deputy institute directors for scientific affairs. They, as no one else, know the value of creativity which does not tolerate rigid control of ideas and conditions under which these ideas arise. They reasoned their negative position approximately thus: socialist production requires a high level of organization and discipline. The more rigid the daily schedule the more conditions for fully utilizing each minute. A man should be constantly at his desk as he can always be needed by a leader. What would happen if the director showed up at 1000 hours and what could you do without him? Or a department head arrives at 0700-0800 hours while the remaining co-workers arrive by 1000 hours; what would he do alone? Subordinates are late, they endeavor to take care of their own concerns and we make this easy for them by introducing SGR.

One is surprised by the orientation of such statements toward regimentation and red tape. A schedule is offered whereby each person is the master of his own workday. The main thing is to promptly carry out one's assignments within the stipulated weekly amount of working time. But now it is impossible with a stopwatch in hand to monitor employee discipline at the entrance. If a worker is a couple of minutes late, he is a bad worker. But if he has come 15 minutes earlier, he is concerned for the job. Such patness and such a black-and-white view cause alarm. The image of Arkadiy Raykin comes to mind, who, having dashed into the office on time, took a long time to settle down, displaying his wife's hurriedly put-on toilet articles. But the most important thing is to dash in on time in order, having arranged the papers on the desk, to go out for a half-hour smoking break.

Let us turn to the results of sociological research conducted at Dneprogiproshakht in May 1981. The questionnaire covered two-thirds of the institute's workers. Questions

were asked about the type and route number of the transport which brought the person being questioned, the time of leaving home and leaving work and the opinion about SGR was sought. Since the institute had been working for 3 years already using SGR, both the working conditions and the opinion of the people had already become established.

The distribution of the person's questioned according to the time of arrival and departure from work provides an opportunity to draw a number of conclusions. The opponents consider as the most serious drawback of SGR the lack of control over subordinates who, in the absence of supervision, "will twiddle their thumbs." But they proceed from the assumption that we are capable of working (or appear to work) only in the presence of supervision. But how can that be if according to the data of other research the leaders of the services, departments and laboratories each year spend at least an hour on meetings, discussions and quick trips to the superiors?

Here is what the persons questioned at Dneprogiproshakht have to say about the flexible work schedule: "For me, the flexible schedule has provided relief from excess nervousness related to the lack of transport and the fear of being late"; "An opportunity has appeared in the morning to send my child to school and not to worry that I will be late. For me the flexible schedule is vitally necessary"; "I feel calm under any circumstances"; "The SGR makes it possible to take my child to nursery and get to work on time"; "The nervous strain of the fear of being late to work has gone. I propose that for persons fond of brief private talks that a special room be set aside as for smokers"; "The results are only positive. The transport problem has been solved. Work efficiency is maximum"; "The SGR gave me a more advantageous and complete distribution of personal time and strengthened by nervous system. For the institute, I feel it strengthened discipline"; "For the institute there was the consolidating of the collective as there was no need to run after transport and write an explanation why you were late 2 or 3 minutes and then discuss in working time how difficult it was to get to work. At present, the co-workers arrive and immediately begin to work"; "An improvement in the psychological climate in the section. A rise in labor productivity and an improvement in labor discipline"; "There is no one late to work. The net working time is fully worked. Labor productivity has risen. There are no strained nerves. I fully approve the flexible schedule."

There is no reason to continue this list, since from the more than 600 questionnaires only in one was there the reply: "The flexible schedule has not provided me with anything." In 5 questionnaires there were requests to improve the reliability of the automated accounting system which sometimes makes mistakes as well as proposals to consider extra time worked.

The results of the questionnaire leave no doubt as to the social utility and the socioeconomic effectiveness of using the SGR. The results of a questionnaire in Kokhtla-Yarva reached analogous conclusions. As 70 percent of the persons questioned feel, the flexible schedule has increased the value of working time. Some two-thirds of those questions pointed out that the SGR made it possible for them to give more time to their children. The same number pointed out that they began to make better use of their leisure. Finally, more than one-half felt that their relations with direct superiors improved.

Thus, there cannot be two opinions. Take up and introduce the SGR. But here it is essential to check everything thoroughly. We have given examples of results from

a considerate, thorough approach and a careful preliminary preparation and analysis. It is important to provide an organizational and technical basis for the SGR. But the main thing is the political indoctrination in the collective. In and of itself the SGR cannot force more productive work, strengthen discipline or raise the awareness of people. The flexible schedule is one of the advanced forms of the organization of labor, but it requires better labor norming, a precise regulating of duties, executor discipline and responsibility. Only on this basis can a flexible work schedule shift relations from the sphere of control from above to self-control and collective responsibility.

10272
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POSITION OF INDUSTRIAL SOCIOLOGISTS DISCUSSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 151-152

[Article by Yu. A. Drobotenko, deputy general director for economics, and N. S. Miroshnichenko, chief of the sociological laboratory at the Kirov Plant Production Association in Leningrad: "In Search for a Generalization"]

> [Note: This article and the subsequent three on sociology are replies to an article by V. A. Skripov entitled "Notes of a Plant Sociologist" published in EKO, No 11, 1981]

[Text] In Leningrad there are around 200 plant sociologists who are supported by the economic leaders, the party and social organizations. They have no reason to complain about the absence of normal conditions on the job. However, the organization of their activities at each enterprise is arranged differently, the better variations of solutions have not been defined and a regulation governing the sociological service, regardless of the widespread nature of plant sociology, has not been worked out. Up to now it has been disputed that the sociologist has the right to make recommendations which propose a "reconstruction" of the existing relations in a collective and so forth.

Proceeding from the more than 13 years of work experience for the sociological laboratory at the Kirov Plant Production Association, the following must be recognized: a majority of the difficulties are a direct consequence of the ambiguity in the organizational and methodological support for social planning, of the carrying out of sociological research and, most importantly, the ambiguity of the status of plant sociologists. The elaboration of a standard guiding document (a standard regulation governing the sociological subdivision of an enterprise) is a question of primary importance. It must clearly define the tasks of the sociological service, its rights and duties as well as the place of the sociologists in the functional structure of the enterprises. Such a document could be worked out by the State Committee for Labor and Social Questions together with the Institute for Social Research of the USSR Academy of Sciences and the sectorial ministries.

However, as long as there is no general regulation, we need particular standard ones. It would be most correct, relying on the acquired experience, to adopt practical measures to strengthen the positions of plant sociology without waiting until the Ministry of Higher and Secondary Specialized Education adopts a resolution to train sociologists, until the development level of sociological thinking among the leaders of all enterprises

is raised and so forth. Even now, it would be possible to quickly organize a rise in the skill of working sociologists or additional training to work at enterprises for philosophers, psychologists and political economists who, as experience shows, most quickly master the position of plant sociologist.

In our opinion, an acceptable sociological service for enterprises with over 10,000 employees would be a subdivision of 8-12 specialists, 5 for medium-sized enterprises and 1-3 sociologists for small ones.

10272
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INDUSTRIAL SOCIOLOGISTS NEED ACCESS TO BETTER INFORMATION

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 153-154

[Article by F. I. Pivovarov, deputy director of the Magnitogorsk Metallurgical Combine imeni V. I. Lenin: "The Sociologist: At the Sources of Information"]

[Text] Leaving the theses on the usefulness of various methods for obtaining reliable social information to be discussed by the colleagues of V. A. Skripov, I would like to take up two questions raised in the article.

First of all, sociologists are invited to work at an enterprise not because this profession has become fashionable and not because certain new, hard-to-solve or mysterious phenomena have appeared in the activities of industrial enterprises. The days of the Magnitogorsk Metallurgical Combine, for example, are just as intense as they were in the past. However, we see that far from all the reserves have been exhausted. Primarily, these are social ones. Every production worker is familiar with the "eternal" problem of introducing a novice to the production collective. It is the job of the foreman and shop chief to organize the welcoming of the youth. There are many variations for this. According to one of them, the shop chief personally receives, talks with and sends the young man to the labor engineer and he, in turn, sends the person to the foreman, and the foreman finally decides. According to a different one, the new man goes to the labor engineer and then to the foreman, the foreman introduces him to the brigade and the brigade decides whether to accept him or refrain, and then the new man goes to the shop chief. Then there is a system of obligatory talks with the new man for 3 years of work and a mentor is assigned. The scheme is complex, sociologists were not involved in working it out, and just how effective it is and how it influences the youth--this is the question for them.

Sociologists have a specialization, the social functioning of the enterprise and the conduct of groups and collectives in the production sphere. It is their task to optimize the taking of management decisions concerning the life of the collective. Today the workers and economists have confronted sociologists with the question of how effective are the existing systems of material incentive and tomorrow we will instruct them to be concerned with the problem of social deviations from standards of conduct. Also on the agenda is the stabilizing of consumption.

In any event, the sociologists should refer to public opinion, analyze the acquired statistical material, compare information obtained by various ways and analyze and

give the leaders fundamentally important proposals on eliminating one or another problem. It must not be forgotten also that when a group is at work, relationships of mutual aid are formed in it, a collective opinion, group evaluation, a discussion of facts and results and so forth go to work. The sociologists grow theoretically and experience is gained.

There are many persons who would like to be directly under the first or second leader of an enterprise. This is understandable as the fewer chiefs there are over you, the less the control and the shorter the path to realize proposals. But the director or his deputy should not read reports on the results of research or mathematical computations on the results of processing social information.

Complete recommendations and conclusions are needed. Their reliability should be repeatedly tested and hence, in addition to the sociologist, someone should bear responsibility for the quality of the recommendations produced. The personnel department or another subdivision which should include sociologists could become such a filter. Undoubtedly, the sociologist or his service should be in that section which receives the largest amount of social information and which works out the management decisions on the social level. In our enterprise such subdivisions are the personnel section and the section for the organization of labor and wages.

10272
CSO: 1820/1

SOCIOLOGISTS NEED TO MERGE THEORY WITH PRACTICE

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 154-155

[Article by N. V. Sekretaryuk, section chief at the Lvov Affiliate of the Center for the Scientific Organization of Labor and Management and the Elektron Production Association: "To Specialize in Sociology"]

[Text] V. A. Skripov has rightly pointed out that the sociological services at enterprises have still not won the proper place in the management system. Here it is not merely a question of a "double language," that is, a different understanding of the tasks and possibilities of plant sociologists. The main reason is in the system of their training and the existing work practices in production. Up to now the methods have not been found for closely combining the theory of sociological research with practice. As a result, the specific elaboration of the organizational forms and methods of management suffers.

Obviously, the way out of such a situation must be sought in the specialization of the sociologists. The present level of production and management has become so complex that a worker is far from always able to understand all its aspects with sufficient competence. For example, a production engineer who has special training as a sociologist can successfully undertake social research in the area of production methods. The same is true in personnel service, the economic service and so forth.

There must be a more careful study of the question on the structural subordination of the plant sociologists. It is best to "assign" the sociologists to the NOT [scientific organization of labor] section, since their functions overlap in many areas and the NOT workers basically use similar methods of observation and research.

It is essential to bring the production and social information closer to the NOT sections (the information is also essential to them) and to the sociology laboratories, having provided them with the appropriate information channels.

Broadening the area and improving the quality of sociological research will be possible if greater attention is paid to these by the enterprise leaders, the party committees and the trade union organizations. It is essential to work out more detailed and accessible methods for calculating economic effectiveness obtained from introducing the specific recommendations of sociological research. In addition, it would be very useful to incorporate into the management retraining programs a special course for studying the tasks, methods and content of sociological work in the national economy.

10272
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DUPLICATION, WASTED EFFORT AMONG SOCIOLOGISTS OBSERVED

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[Article by V. A. Tyutyunnik, chief of the Section for the Scientific Organization of Labor and Production at the Azot Production Association in Severodonetsk, Voroshilovgrad Oblast: "The Closest of All to Sociology"]

[Text] V. A. Skripov considers it incorrect to include sociologists as part of the NOT [scientific organization of labor] service since, in his words, a sociologist's functions are significantly broader. This is a weak argument, for you probably could not find broader (and more indefinite) functions than in the NOT subdivisions. In truth, the inclusion of sociologists in the personnel section also makes sense. The effectiveness of sociologist's work depends not so much upon the place of "assignment," as upon his initiative and, of course, skills.

In our association the sociologists are part of the section for the scientific organization of labor and production (NOTiP). We have asked them what their opinion was and this was confirmed.

Statements to the effect that in the NOT subdivision everything is aimed at achieving only an economic effect and this puts the sociologist in difficult conditions are invalid. In actuality, the NOT subdivision is equally interested in efficiency, both economic and social.

The experience of the Severodonetsk sociologists indicates that the work carried out by separate groups or individual sociologists in many instances leads to duplication. Thus, in studying the external reasons for personnel turnover and a relatively large number of leaves without pay, the sociologists of all enterprises have inevitably been forced to study the organization and operating hours of the city's service sphere. Each person formulates the results and conclusions depending upon how effectively the research has been carried out on a particular level of confidence and being guided by the particular local tasks. Nothing may be said about the quality of these parallel "sallies." The quality is low while the labor expenditures are high. This and other research could have been carried out with a much greater effect by joint efforts.

Probably the enterprise leaders would agree on setting up a unified center for social research on the city, and to staff it under a shareholder agreement. Such a center could provide more skilled services to all the city enterprises and institutions which

engage labor resources as well as provide the necessary information to the city party committee and gorispolkom. Conditions would also appear for accumulating a file of decisions, for increasing the qualification and particularly for coordination and procedural improvement.

Everyone recognizes that an army of sociologically thinking people is essential and for this reason one of the functions of plant sociology is educational. But this is not enough. It is essential without fail to organize sociological training for the students of technical VUZes, in training them as the future production commanders. As a rule, the graduates of these VUZes, in knowing the equipment and production methods well, have difficulty in mastering the sociopsychological situation at the enterprise, they do not see the sources of moods and conflicts and do not know the bases for organizing moral and material incentives for the collective. In encountering the need to lead the collective, each of the graduates has repeatedly fallen into difficult sociopsychological situations, he has found it difficult to take a decision, to choose a line of conduct in many atypical situations and has not always understood the reasons for what was happening.

The teaching experience at the Severodonetsk affiliate of one of the Moscow management advanced training institutes indicates that the students are enormously interested in studying psychology, sociology and the practical aspects of management organization. There is, consequently, a need to gradually provide the specialists with a certain total of knowledge on the development laws of the collective, individual psychology and to teach the leader to consider the sociopsychological factors which influence the life of the collective. Much can be done having strengthened the corresponding sections of the existing training programs in the sectorial institutes and by increasing the number of leaders being trained on them. The obtained knowledge will be a valuable addition to the basic profession.

10272
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STUDIED APPROACH TO PLANNING, ORGANIZING, STAFFING URGED

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[Article by Doctor of Technical Sciences R. F. Zhukov, Professor and Head of the Chair for Psychology and Engineering Pedagogics at the Leningrad Polytechnical Institute: "A Self-Monitoring Method for Subdivision Leaders"]

[Text] [Editor's introduction] Today executives will again find advice in this journal. Of course, it is easier to give recommendations than it is to carry them out. However, we are far from thinking that we will teach adult and experienced people. We offer you merely another chance to carefully examine what ideas you may have missed and to compare your "knowledge and deeds."

We are hopeful that you will be aided in this by the studies of Prof R. F. Zhukov carried out using the method of active sociological analysis and control (MASTAC).

The editors put these up for discussion by a group of leaders and specialists (readers of our journal). We have considered the proposals and comments voiced by them. The published text is the result of the collective effort by Prof R. F. Zhukov and the EKO readers.

The editors would like to thank everyone who participated in the discussion: G. A. Voropayev (Minsk), G. I. Dunets (Volgograd), R. A. Zheleznyak (Tashkent), Yu. Ye. Zvyagintsev (Kharkov), Yu. Ya. Kuznetsov (Karaganda), V. Ye. Makarov (Khabarovsk), A. F. Sil'chenkov (Moscow), I. I. Usachev (Volgograd) and mand others.

The method of active sociological analysis and control is designed for the independent improvement of a manager's work style. What is the essence of it? In a periodic self-examination of carrying out recommendations to improve the work style, in ascertaining the factors having a negative effect on work effectiveness and in checking the effectiveness of the measures employed.

The following work procedure with the procedural concepts is offered.

In the margins, opposite each recommendation, put an estimate of its importance, how you understand it, using a five-point system. In advice with enumerations (or consisting of two parts), put an independent evaluation for each position (part). Since the management methods employed by various leaders can differ sharply, it is not surprising if some advice seems to you nonessential, inapplicable or even incorrect. Give these a low number and do not use them now. But give some thought to what conditions they could suit.

The advice which you regard highly, endeavor to carry out fully. After the first, put the second estimate for the actual use of a recommendation in your practice. Having compared both number of points for each advice, you will see by how much your knowledge differs from the deed. Give some thought and undertake measures to increase the second estimates. A week or two later, again make the importance estimates. Have they changed? Then repeat the procedure once a month until the number of points coincide fully (for importance and use).

Don't forget to revise the importance estimates. Possibly they will change as the advice which seemed inapplicable to you yesterday may now seem timely and necsssary.

1. Professional Organizational Qualities

1.1. How inherent are these qualities to you:

a) The ability to assess the real situation reasonably;

b) The ability to work in a stressful situation;

c) Interest in the new;

d) Decisiveness;

e) A high level of general culture?[1]

1.2. As a rule, high labor productivity, the skilled execution of assignments and lower personnel turnover are achieved by leaders who focus not only on the tasks confronting the collective, but also on the collective itself which must carry out these tasks.

1.3. Never feel that your organizational and production methods are the best. One of the main principles for you should be: everything can be done better than up to now.

1.4. "Who knows what port will be reached if there is not a fair wind" (Seneca).

Don't start a job unless its goal and tasks have been clearly defined.

1.5. One of the paradoxes is: when we spend time on planning, there is more time. An hour of effective planning can save 3 or 4 hours in carrying out the plan and will produce better results.

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[1] You could extend this list: the ability to anticipate, to coordinate, firmness, strictness with oneself and others, a feeling of responsibility, duty and so forth.

Work according to a precise and concrete plan (an excessively general plan can virtually not be fulfilled). This helps you control events and escape unforeseen problems.

1.6. As is known, it is impossible to achieve steady results in routine activities if concern for the future is not shown. The solving of future problems should become your basic concern.

1.7. The urgent overrides the important. For this reason always, and particularly under the conditions of a shortage of time, determine the important thing and concentrate attention and efforts on it in order to escape emergencies in the future.

1.8. F. Bacon commented that "we can do as much as we know. Knowledge is power." Create an effective system for constantly adding to the general and special knowledge of all co-workers.

1.9. In speaking about the "boldness of ignorance," one has in mind the seeming simplicity of resolving questions for which one lacks sufficient competence. Only a specialist sees in his area the multiplicity of delicate and important questions which are concealed from the uninitiated.

Endeavor to be completely independent only in that area where you are a specialist, using in others the knowledge and experience of other people.

1.10. Delegate the settling of routine matters to subordinates. This encourages their initiative and develops ability under the condition that you help and instruct them.

1.11. You will ensure significant order in work if the delegating of permanent powers is reinforced in the job instructions and temporary ones in individual instructions. Here it is essential not only to clearly define rights and obligations and times of execution, but also indicate the methods for carrying out duties.

1.12. Develop in yourself the ability to take a sound risk, to assume responsibility for the introduction of innovations, the realization of outlined plans and objectively analyze the reasons for your successful and unsuccessful undertakings.

1.13. Of the three evils: error, overinsurance and idleness, the first is the least. Do not fear making a mistake as having understood a mistake it can be rectified. Overinsurance and idleness deprive you of authority.

1.14. Having discovered a mistake, do not limit yourself to eliminating the failure in work, but without fail provide measures which would eliminate the reasons for its repetition.

1.15. Too frequent and in addition poorly organized reforms do not so much rationalize work as they increase its volume, distracting the workers from carrying out their basic duties.

1.16. Do not make the mistakes frequently encountered among leaders:

a) A lack of collectivism in discussing important and long-range questions;

b) A lack of confidence in co-workers;

c) A prejudiced attitude toward individual co-workers and the results of their labor;

d) Ascribing to oneself the results of the collective's labor;

e) The issuing of commands instead of persuasion;

f) The praising of insignificant successes.

1.17. Around a quarter of a leader's working time is taken up with official meetings. At a meeting bring up only those questions which cannot be resolved under ordinary working conditions.

1.18. The participants in meetings waste time not only directly at the meeting, but also in assembling, traveling, returning and "getting back" to work. For this reason the start and end of a meeting must be planned so as not to leave "empty" segments of time; if it is to end 15 minutes before a lunch break, then these probably will be lost minutes.

1.19. All essential information should be prepared ahead of time by the appropriate worker. A discussion of only the deviations from the normal course of work significantly reduces the length of a meeting and increases its effectiveness.

1.20. The basic task of a meeting is not to find the guilty party, but rather to determine what must be done.

1.21. Demand specific proposals from the speaker.

Each of them should be certain that he can speak frankly.

1.22. Strictly supervise and without fail publicize the carrying out of the decisions adopted at each meeting.

2. Moral-Psychological Qualities. The Leader as an Indoctrinator

2.1. The personnel has been correctly selected if each person corresponds to the position held and the position, in turn, meets the needs of the co-worker.

Study the creative abilities of your subordinates, their interests and inclinations. This helps in correctly placing and more effectively utilizing the available personnel and to create a situation of professional comradeship and mutual aid in the collective.

2.2. A clear assigning of duties and the formulating (as a document) of the principles and methods for carrying out certain types of work by specific executors can prevent conflicts. Here it is important to regulate only the basic aspects of activity in order not to deprive subordinates of independence and not to turn leadership into petty interference. Before assignment to a position all the potential co-workers of an organization must be made familiar with this document without fail.

2.3. Authority will help you achieve clear and smooth work from the executors. Many wrongly feel that it automatically comes with the official position. In actuality, the latter merely gives one the right to win and utilize it.

2.4. The growth of authority is significantly aided by patience for the weaknesses of people which do not impede their work and, on the contrary, impatience for everything which reflects badly on the work. As a leader, you have the right to demand the high-quality performance of assignments. Subordinates, in knowing of this obligation, lose respect for you if you carry it out poorly.

2.5. A lack of self-control, impoliteness and shouting in relations with subordinates cause great harm to authority. Develop your feeling of self-control of emotions, promote the habit of restraining yourself and not losing self-control. Even Horace pointed out that "anger is a short madness."

2.6. Assignments and orders must be given in a calm tone, having formulated them precisely, completely and constructively so that everyone uniformly knows what must be done, how this is to be done and what result is expected.

2.7. A bad leader knows what must be done. But a good one shows how this is to be done.

2.8. The basis of healthy relationships between a leader and a subordinate is mutual respect. Injustice vis-a-vis subordinates and colleagues who have better abilities leads to a loss of respect and the turning of your power from an actual into a nominal one.

2.9. Leonardo da Vinci considered that "an enemy searching for your mistakes is more useful than a friend desiring to conceal them." Be able to seek out the rational kernel even in hostile criticism addressed to you.

2.10. If one of your subordinates voices an opinion opposite to yours, criticize the opinion, but not its author.

2.11. Usually co-workers are willing, without sparing themselves, to carry out assignments which are interesting for them, but endeavor in every possible way to save their efforts when the work seems unimportant or unworthy of them. To make even uninteresting work important in the eyes of subordinates and to raise its prestige up to the level of the worker's prestige and higher--this is the art and professionalism of the leader.

2.12. It is essential in every possible way to support the workers who are actively looking for a solution to the set tasks. Aid their struggle against shortcomings and help develop their dignity. Promote them more boldly.

2.13. In settling the question of an appointment, don't forget that the people taken from outside will not always be able to fit easily into the collective or justify the hopes put on them. The good points in them may be noticeable, but the bad ones concealed, while you are already equally familiar with both in co-workers working in your organization.

2.14. Among the workers of any level there are always persons who show a passive attitude toward the job and work unproductively, in simply serving out their working time. Try to analyze the reasons for such an attitude. Possibly this is caused by the following:

a) Excessive interference from the immediate leader;

b) The absence of psychological and organizational support;

c) A lack of information, including on the results of one's labor;

d) A discrepancy between the assignments and abilities;

e) The dryness and lack of attention by the leader to their needs.

2.15. Only one person should be responsible for solving a certain question. If a job is performed by several persons, it is essential to appoint a person in charge.

2.16. The work will not be well carried out if a stipulation is not made of the times and limits within which it should be done, however unpleasant these limits may be. "Complete freedom to do everything you want like you want to is in essence the freedom to do nothing at all" (N. Wiener).

2.17. Better is the enemy of good. Demand that your subordinates perform a job at a designated time. If a date is not stipulated, then a person will look not merely for a correct, good decision, but rather the best and this can continue until infinity.

2.18. A person is not a machine: work at reduced capacity lowers the potential of his resources. Reduced assignments spoil the workers. For this reason it is better to give an assignment with a shortened (but realistic) time than with a drawn out one.

2.19. At least once a month it is essential to check the efficiency and degree of awareness of responsibility on the part of your subordinates by strictly auditing one of the most important tasks.

2.20. Institute a systematic and prompt verification of the course of carrying out the plan. A delayed check and adjustment lead to the excess expenditure of resources.

2.21. An indispensable condition for the success of any measure is commendation for successful work and condemnation for oversights and failures. Here both the punishments and the commendations should be commensurable with the workers' actions and directly follow them.

2.22. The choice of indoctrinational means is great and we often employ only a few which are customary and liked:

a) Commendations: congratulations on the success; thanks for prompt and precise work; recognition of the obvious rise in the professional skills of a worker in comparison with the past or with his comrades; the granting of a brief leave; a reduction in the active load; an interesting trip; granting the right of self-inspection; the lifting of a previous punishment; a monetary prize; promotion;

b) Punishments: comment, rebuke; public condemnation; a sentence; a loss of bonuses; disadvantageous comparison with other workers; the depriving of certain additional benefits; the loss of legally unbinding concessions such as the possibility of leave for personal affairs, delay in a planned promotion, the introduction of more scrupulous reporting and so forth.

Reflect over your disciplinary practices and judge them as if from outside.

2.23. As a rule, condemnations and commendations should influence not only those for whom they are designed, but also the entire collective which should be informed about what has happened, the causes leading to the event and its assessment by the leadership. However, in individual instances, proceeding from the specific misdeed and personality of the worker who committed it, it is better to rebuke a co-worker alone than in front of everyone.

2.24. In setting a meeting for subordinates, explain its goal ahead of time. This will help them collect the necessary material and will help you in better resolving the discussed question.

2.25. In talking with a co-worker, don't look through papers which do not relate to the conversation, don't excuse yourself to him, do not repeatedly summon a secretary and give her instructions which do not relate to the question being discussed; do not look out the window; do not drum your fingers on the desk, expressing impatience.

3. The Organization and Techniques of Personal Work

3.1. Many jobs are difficult merely because we organize them incorrectly or work at a poorly organized desk.

3.2. An ordered desk is an important condition for fruitful work. It is ideal if on the desk lie only the documents and materials needed at a given moment. The files, references and so forth piled up on it not only reduce the work area, but also distract one from analyzing the current question.

3.3. Keep and add to a card file. Various information, excerpts, data and thoughts entered on cards and grouped by sections will help you in 10-15 minutes to prepare information or a speech on virtually any question. Always carry several clean cards with you for jotting down successful ideas or important observations.

3.4. Labor without rest is not an accomplishment, but rather, on the contrary, a punishment for the unsuccessful planning of one's time and unsatisfactory organizing of labor. Self-discipline is the main thing for the correct allocating of one's time.

3.5. Acquire the habit of regularly evaluating the allocation of your time mentally and you will develop a new attitude toward it.

3.6. A majority of people do not precisely know how they spend their time. For a week note down all your undertakings in each 15-minute interval. Inevitably there will be unnecessary jobs and the matters not related to the basic goals will become apparent.

3.7. A daily schedule, like any system, shortens the path to the goal. Each day give some thought to new measures to save your time.

Naturally, the listed advice does not encompass the entire diversity of problems which a leader encounters in his daily work. These can be taken as the basis which can well be supplemented (both by individual recommendations as well as by entire sections) and clarified in the process of use.

10272
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BOOK ON INFORMATION REVOLUTION REVIEWED

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[Review by Candidate of Economic Sciences B. P. Kutyrev from the Institute for the Economics and Organization of Industrial Production under the Siberian Division of the USSR Academy of Sciences in Novosibirsk, of the book "Chelovek v potoke informatsii" (Man in the Flow of Information) by V. Z. Kogan, Novosibirsk, Nauka, 1981]

[Text] "Whatever don't we see and hear in this world!" exclaims the optimist excitedly, believing infinitely in the omnipotence of knowledge.

"Alas," sighed the pessimist, "we can see or hear nothing but information...."

Who is right in this brief dialogue? Both partners are right because, in addition to primary information, one can also be acquainted with information about information or **metainformation.** In the world the scope of undertakings with metainformation is constantly growing broader, and evermore is being said about the rise of a separate scientific discipline, **informology.** A description of this discipline has been published by the Candidate of Philosophical Sciences V. Z. Kogan in the popular scientific series of the Siberian Division of the Izdatel'stvo Nauka [this reviewed book].

The reviewed book is a popularized version of the two previously published scientific monographs.[1] One of these analyzes the structure of the information flow of social information, and offers a method for dismembering it and this could be operationally convenient under the conditions of any research. The information transmission channels are designated and the social features of their functioning are examined, while bourgeois theories are criticized. The second book deals with a number of problems related to the production, transmission and consumption of information in a socialist society. These same questions are taken up in the work "Chelovek v potoke informatsii."

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[1] A. N. Kochergin and V. Z. Kogan, "Problemy informatsionnogo vzaimodeystviya v obshchestve. Filosofsko-sotsiologicheskiy analiz" [Problems of Information Interaction in Society. Philosophical and Sociological Analysis], Moscow, Nauka, 1980; V. Z. Kogan "Informatsionnoye vzaimodeystviye. Opyt analiza sub"yektno-ob"yektivnykh otnosheniy" [Information Interaction. An Attempt at Analyzing the Subject-Object Relationships], Tomsk, Izd-vo TGU, 1980.

Thus, it is obvious that V. Z. Kogan is acting as a true **informologist.** In knowing that the interests and needs of various groups of readers vary, he has adapted his metainformation in the appropriate manner. A specialist has his specialist ways and an amateur has amateur ones. Such adaptation is essential because, along with the increased volume of information, there has been a growing need for knowledge on how to control this. The given subject is discussed and studied by philosophers and geneticists, by literary critics and cyberneticians, by ethnographers and zoologists, by engineers and physicians, by economists and teachers. Literally everyone wants to know everything about information. The echo of the informational "megabit" (a bit is a unit of information) explosion has penetrated the classrooms and gone into space. The continuous information noise is growing. One can either cover one's ears and close one's eyes or try to understand how and why noise arises. Here one uses **informology.**

When it is a question of information, an entire ocean comes to mind, boundless and constantly replenished, rough and even swallowing those who dare to set to sea without having a pilot and a compass.

The science of informology described in the book should help one to navigate boldly through the ocean of information. Informology discloses the flows (currents), their origin (the subject), the direction (object), the intensity and consequences. It helps to define the future, the consequences, the "echo" of the waves, the informational ebbs and flows. If one takes information generally, it seems formless and unpredictable, but if one breaks it down, as V. Z. Kogan does, into personal, special and mass, then forecasting becomes possible although difficult.

The introduction to the book has been written in the form of an entertaining dialogue, from which one can see that the author has considered his work as if it were a forthcoming long voyage, in endeavoring to make the suitable preparations for it. He writes: "In commencing the text of a popular monograph, the author, it seemed to him, envisaged all (or almost all) the questions which the readers would want (or could want) to ask and considered himself prepared (or almost prepared) to give the necessary answers" (p 3). But then appears the punctilious reader wearing Zeiss glasses who asks: "What precisely is this science that you are describing?" In other words, who has outfitted and manned the crew which is to set out to investigate the fields of information interactions? Who has equipped it with charts and routes (in the fourth section of the book, one chapter is entitled "Heroes of the First Routes. General Comments"), who has learned to use the controls (the chapter "The Lever of Information" in the second section), to determine depth (value and utility), to cross "barriers" and so forth? Here there must be a description of the concept of informology.

Thus, the ship has arrived in the information sphere which encompasses the entire planet and which the author proposes representing in the form of a chart. This flat model is called an information field. A certain quantity of information is generated in the field. Observers and researchers are interested primarily in the questions concerning the sources of information, the period of its life, the nature of movement, degree of utility and so forth. The systematizing of such questions makes it possible to isolate several, most essential features of the functioning of information, namely: the scope of circulation in the information field, the time of circulation, the directions of movement, the emotional tint of the information, the method of its production and the goal of production.

Incidentally, we will not repeat the author's routes and his observations as it would be more interesting for the reader to learn this from the book. We would merely point out that the voyage is not only scientific-cognitive, but also exotic. We learn, for example, that a predominant share of journal information is superfluous because it is obsolete, being published in prejournal editions. We become acquainted with such varieties of humans as the **"homo informativus" (the informed man)** and **"homo informatus" (a man containing information or sharing it).** We also will read unusual expressions such as **"social echo," "megabit explosion," "infoflows"** and many others. And let us pardon the author for his excesses. A new discipline constantly wants to separate itself from others and in these attempts the inventing of new words is not the most reprehensible.

In a general form the book describes the ontological (what is information, what is its flow), the axiological (for what reason information is valuable for society as a whole and for an individual man) and the gnoseological (how informological objects are studied) aspects. It has been written in an entertaining and interesting manner, with humor, although not uniformly evenly everywhere. Erudition is combined with a careful analysis and conclusions. In a word, it is interesting to read the book.

10272
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BOOK ON HUMAN COMMUNICATION REVIEWED

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[Review by A. M. Bernshtam, head of the Sector for Labor Sociology at the Western Siberian Affiliate of the Scientific Research Institute for Labor, and Candidate of Technical Sciences R. P. Povileyko, from Novosibirsk, of the book "Kommunikatsii v organizatsiyakh" (Communications in Organizations) by E. Rogers and R. Agarwala-Rogers, translated from the English under the editorship of L. I. Yevenko, Moscow, Ekonomika, 1980]

[Text] An engineer who has proven himself to be a good organizer, the chief of one of the sections, was transferred in the same capacity to another production area. And the new area which prior to this had been while not among the first places at least not in the latter, began working worse: productivity declined and instances of disciplinary infractions appeared. Why did this happen? The section chief had become a poorer organizer than he had been up to now? Scarcely. The workers could not understand their new chief? Obviously, this is the case, but why? The authors of a new translated book on communications in organizations [the book reviewed here] indicate that the reason for the arising misunderstanding between the section leader and the workers was that the leader, having become accustomed to the old labor collective at the previous work area, approached the new collective with the same measures. And here his excessively trustful attitude toward the workers and the irregularity of supervising fulfillment (this had been justified in the previous collective) were seen as the leader's weakness. As a result of this, labor discipline began to decline and product quality deteriorated.

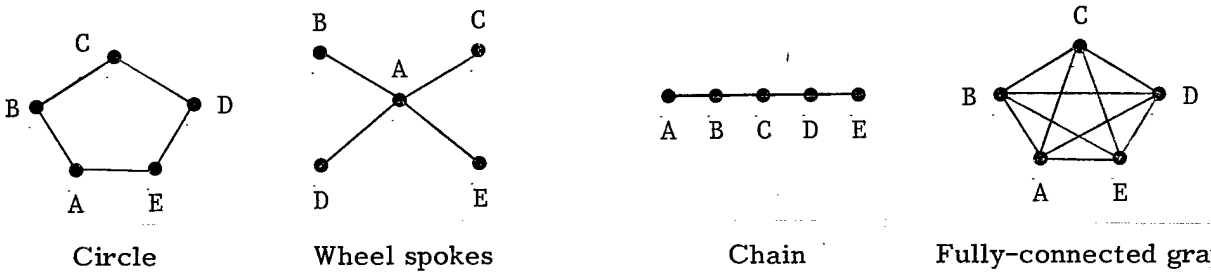
The described situation is not infrequent in modern dynamic production and is very indicative under conditions when a reorganization in production ignores the complex communicative processes occurring in a labor collective.

What is communications? In the most general form this is a process in which a message or information is transmitted to the recipient and returned in the aim of changing, improving or optimizing the conduct of both the giver and the recipient in the course of a work dialogue. Of course, this process cannot be reduced to a dialogue as a large number of persons may participate simultaneously in it, but at each given moment control usually ends up between two; they can be colleagues or can be in relationships of control and subordination. In any event, communication is primarily direct contact between the members of the organization on a psychological, personal microlevel.

Often in our times, one can see organizations in which there is a noticeable surplus of information traveling downwards, but a lack of information traveling upwards.

The organizational structure should help to condense the information, otherwise the superior leaders will be drowned in an ocean of paper. Let us assume that a seven-level hierarchy has been formed which is optimum in terms of volume. If the average number of subordinates for one superior equals 4, then in a unit of time 4,096 units of information will be generated below. On each of the six superior levels, usually approximately 50 percent of the data will be weeded out, so that the organization's leader will usually receive just 1.6 percent or 98.4 percent of the information is eliminated. If there are 7-10 subordinates on each level (this is more realistic), then the end volume of the compressed information will be less than the initial, but not so strongly as with 4 subordinates. The desire to encompass all (?!) information and to control everything and everyone lead to an informational overload for a leader. Not only does his work become ineffective, but also the actions of his subordinates. He disregards the work duties of other members in the group (and his own as well), he increases their mistakes (and his own too), and as a result makes the entire organization inefficient and unable to work.

A knowledge of the particular features and patterns of communciations makes it possible to resolve many organizational questions very effectively. As is known, recently large offices have been organized more and more often without individual rooms according to the so-called "plantation" system. The traditional attributes of success (a separate office and so forth), the book states, are becoming less apparent in the business world than before. Today a chief more and more often sits among his subordinates, in the view of everyone, because his office no longer has internal walls. One of the advantages of such a system is the flexibility achieved with it: if an individual is more closely in contact with group B than with group A (of which he was initially a part), he simply moves his desk several meters closer to the new colleagues. This may be shown somewhat later in the organizational chart.



Circle Wheel spokes Chain Fully-connected graph

Basic Types of Structures for Communications Network for a Small Group

Another advantage of such a system is the view provided by it. There is no need to telephone Mr Smith and find out whether or not he can participate in a business meeting. This can be learned immediately by glancing at his desk and asking. Due to the abolishing of walls, both direct control over workers is strengthened as well as the interaction of the workers with each other in solving problems requiring group discussion.

It is felt that such a system increases the efficiency of an organization. Thus, the efficienty of the work done by the administrative and management personnel of the MacDonald Corporation increased by 35 percent while personnel turnover declined.

At the same time, such a system is far from solving all communications problems in a collective. Research carried out at design bureaus has made it possible to establish that two persons who work on the same floor of the "plantation" and are more than 20-25 m apart rarely maintain permanent friendly contacts between themselves.

One other interesting feature of the communications processes has been noticed and confirmed quite recently. It has been established that an average individual today has from 500 to 2,000 rather close acquaintances and this is the size of an individual's personal communications network. Is this a lot or few? Special experiments have shown that between any two randomly selected individuals in a large nation, independently of its size, there is a chain of not more than five or six acquainted persons which makes it possible, when so desiring, to establish personal contacts. In a city this chain is reduced to three or four persons, and at an industrial enterprise, even a very significant one, does not exceed one or two persons. In other words, having asked the question of a stranger "Do you know so and so?" we will discover common acquaintances in a large city through two or three contacts. In learning the patterns of the communications networks, we would scarcely exclaim ingenuously: "How small the world is!"

The applied value of the book is beyond dispute. Unfortunately, the foreword very hazily criticizes the methodological positions of the authors. How their initial premises operate can be shown from the same simple example with which the review starts. Thus, let us return to the above-described picture of the "collapse" of the section with a new leader and endeavor to analyze what conclusion would be reached by the organizer engineer who has followed the letter and spirit of the work by E. Rogers and R. Agarwala-Rogers.

First of all, he would conclude that the leader was unable to correctly organize his relations with the workers. Now the next premise of the authors: "The organizational structure determines communications behavior." Hence the natural conclusion that it is essential to analyze the organizational structure. But the organizational structure consists of the official and unofficial structures, or, as the authors say, of the formal and informal structure. It must be pointed out that the authors in practical terms restrict their analysis to the informal structure, giving excessive importance to mutual affinities, antipathies and other interpersonal relations and leaving outside their analysis such essential phenomena for the organization and communications in labor processes as the content and goal of joint activity. From the recommendations of the authors, it emerges that one has merely to take measures to reduce the differences in the personal relations of the authors, without influencing their attitude toward the goals and tasks of joint labor. But certainly this can lead to even greater mutual understanding between the leader and the worker!

For such translated books it is essential to provide a full scale of critical comments, a sound foreword (afterword) or sharply reduce their size, giving the valuable applied material in separate fragments and excerpts. Such translated "digests" make the foreign practical research and recommendations more acceptable for production workers.

10272
CSO: 1820/1

URBAN DEVELOPMENT IN SIBERIA

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 82 (signed to press 22 Jun 82) pp 176-182

[Review by I. S. Dreytser of the Scientific Research and Design Institute for Mineral Stripmining in Kemerovo, of the book "Gorod v Sibiri (problemy, opyt, poisk resheniy)" (The City in Siberia (Problems, Experience and the Search for Solutions)) by Ye. N. Pertsik, Moscow, Mysl', 1980, 286 pages]

[Text] General V. K. Andriyevich who in 1889 published the "Istoriya Sibiri" [The History of Siberia] did not have too high an opinion of the urban development potential in the territory which stretched to the East of the Urals Range. "This enormous expanse," we read in his book, "up to now has had the general sobriquet of Siberia and probably this will remain forever because nothing but Siberia will emerge from it. The validity of this assessment is confirmed by the 300-year historical life of this world's largest desert...."

Let us remember this last statement as it provides the necessary background for analyzing the monograph on Siberian urban development. Incidentally, we will be just: on one thing the general was prophetic. The name of the region which occupies one-third of the nation's territory has come down unchanged into our times. Today, 93 years after the appearance of this not too optimistic judgment, Siberia on the scales of the national economy clearly "outweighs" many regions of the nation. Moreover, under the conditions of the altered situation it is beginning to set the tone and to act as the pacesetter in many economic "fashions." But in concentrating enormous resources (three-quarters of the fuel and energy, over one-half of the mineral, lumber and water), Siberia possesses a little more than one-tenth of the nation's productive capital and just 8 percent of its manpower.

What has been stated above discloses one of the most important components in the problem of developing Siberia's productive forces, that is, the necessity of a settlement program, the designing and construction of new cities, as well as the choice of the optimum directions for reconstructing and enlarging the old ones. Let us not forget that the city has always been the support base for the development of new territories. The specific features of Siberia such as the unusual scale of development, the extreme natural conditions and the distance away from areas with a high population concentration, impede urban development.

In the reviewed monograph, Ye. N. Pertsik analyzes this conundrum. He uses both economic geographic material as well as scientific studies made by researchers in a number of related areas, primarily in regional economics. The structure of the monograph is determined by such logic of research. After a traditional introduction comes an analysis of the particular features and problems of the Siberian city (Chapter 1), while a discussion of the methodological problems involved in forming the settlement systems on the region's territory (Chapter 2) precedes a review of the regional aspects of city development (Chapter 3). A separate chapter is given over to the improving of the territorial structure of the Siberian city (Chapter 4). An analysis of the ecological problems (Chapter 5) ends the research.

We would like to point out two circumstances at the very outset of the discussion. This is the first time in our literature than an attempt has been made to analyze in a single work the details of the urbanization process for such a large region. The work realizes the idea of a systematic examination of that significant material on the individual Siberian cities and regions which has been accumulated in recent years. Certainly both Siberia and the Far East in terms of the scale and intensity of the urban development processes hold a special place on the nation's map.

Even if one excludes the already mentioned specific features from assessing the nature of urbanization, the researcher and planner will often encounter confusions here which go back to the distant past. In our times, we must pay too dearly for any sort of former errors. It is a question of a territory with a great design and development history in which, along with new development areas there are also vast industrial zones with a long established planning structure and requiring reconstruction.

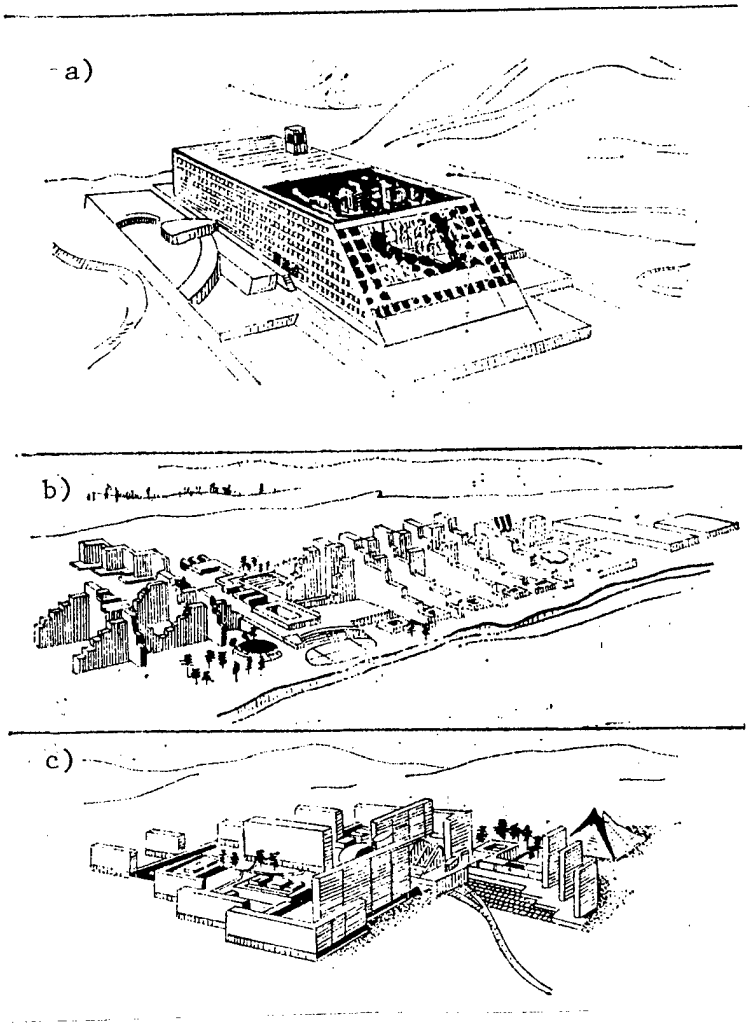
From the heights of the 1980's, it would be possible to explain a majority of these problems by a lack of a comprehensive approach. Yet one cannot bring oneself to strictly condemn our predecessors who did not, as they say, have things easy. It is more insulting when many mistakes have been made later and sometimes now. Then we must move large enterprises merely because their placement because of ecological or, for instance, mining-geological considerations, has ended up irrational.

In this regard, we must recall the valid comment of the well-known researcher Yu. G. Sauchkin about the beneficial influence which the involvement of an economist-geographer has precisely in the initial stage of designing cities and not when it is necessary to reconstruct them and rectify the errors related to a failure to consider the local natural, economic and other conditions. Here the case is the same as in architecture: attempts to emblish the edifice after the conclusion of its construction are doomed to a creative failure from the outset. A true harmony is achieved only by the common efforts of the architect and designer in the design process.

It is no accident that economic geography from within which have repeatedly come many productive ideas for controlling modern urbanization processes, has become one of the basic sciences on which urban development should rely. It can only be regretted that this has still not been reflected in the enforceable enactments. Incidentally, even if the documents would exist, their requirements would often not be fulfilled.

In noticing the increased role played by the economic geographic approach to solving the city development problems, the author formulates a very constructive, in our view, idea on the need to organize a general geographic conception for Siberian urbanization

on the basis of geography, architecture, economics, sociology and ecology. And medicine, too, at least those areas of it which investigate the adaptive mechanisms and the adaptability of man to the natural and climatic conditions of the habitat. It is very significant that in anticipating significant shifts in settlement, the Siberian Division of the USSR Academy of Medical Sciences has long been carrying out work in this area.



Examples of Architectural Plans for Northern Cities:

a)--In the first (most unfavorable) subzone with the possibility of covering the settlement and creating an artificial microclimate over the entire portion of its territory; b)--In the second subzone using covered and internal walkways to the primary service institutions, to the city center and other places of the mass gravitation of the population; c)--In the third subzone using only designing to protect the population against unfavorable climatic factors.

The settlement processes are particularly complex on such specific territories as Siberia. In this regard, I find it a lamentable oversight that in the large plan of intersectorial

research which is now being carried out within the Siberia Program by scores of institutes under the aegis of the Siberian Division of the USSR Academy of Sciences, there has been no concern with the problems directly related to strengthening the process of the urbanization in a region where in the immediate future a population "explosion" should occur.

If a significant portion of the increase planned for the nation in oil, gas and coal, the production of metallic aluminum and copper is to come from the regions of Siberia and the Far East (and at present other possibilities are virtually absent), the realizing of a broad urban development program will be indispensable for us. Before developing these sectors and in order to develop them, we must create good housing and a dependable social and service infrastructure. The attractiveness of new development areas is achieved precisely by this. In planning the development of the productive forces in new areas, the emphasis, as experience shows, must be put solely on permanent personnel. The solving of all these problems requires a significant amount of research done ahead of time.

Monographic research on urban problems is all the more valuable in the fact that to some degree this makes up for these lamentable gaps. In the work of Ye. N. Pertsik, in particular, one should pay particular attention to a number of questions which are on the borderline of regional econmics and urban development. For example, the relationship of economic zoning, regional planning and urban planning. Within the limits of these subjects, I would mention the question discussed by the author of the advisability of improving economic and administrative zoning in the nation. As economists assume, the creation of large oblasts and the organizing of strong planning commissions in them are one of the reserves for improving territorial planning. Such a solution, aside from all else, makes it possible to effectively coordinate the work of the territorial production complexes through the corresponding institutions of the planning commissions. It is no sin to admit that in practice a reasonable reconciling of the interests of the sector and the territory is often lacking. Such a measure, undoubtedly, would improve the situation. This is all the more important as under Siberian conditions the TPK [territorial production complex] are being recognized as the leading form of organizing the economy.

One is also struck by the author's idea on the need to improve the methodology for forecasting the development of cities and considering here the particular features of a region. In particular, a great deal can come from the specific program approach utilized in the work to elaborating a settlement strategy. In discussing the methodological questions of forming a settlement system on the territory of Siberia and the Far East, like, incidentally, the other urban development component questions (consideration of regional features in tapping natural resources, the ways for improving the territorial structure of the Siberian city and so forth), the author returns again to the underlying ideas of regional economics. This is no accident. The development concepts of Siberia, as these have been formed within this interdisciplinary subject also influences many urban development approaches, in shaping the corresponding scheme of urbanization in the region.

In this serious research a slant has formed spontaneously as the problems "on the borderline" have been taken up more vividly than the others. Ultimately, as the author asserts, the economic geographic situation is the fundamental category for the city's geographic theory. But subsequently the city begins to have a serious impact on the

territory. For this reason, Ye. N. Pertsik pays such attention to the forming of the territorial structure of the cities. It, this structure, is set by urban development in unison with regional economics.

Also of interest are other sections of the research, such as: the comprehensive formation of cities in certain areas, the integrated placement of industry in cities, a comprehensive urban development assessment of the territory. If you wish, also the comprehensive use of resources within the territory. This is the author's attitude to the problem of using the territory of cities generally and their underground space, in particular. Under the conditions of Siberia, where the bouquet of cost-increasing factors is particularly lush in urban development, the promptness of working out the problems involved in utilizing underground space is obvious.

Finally, the ecological problems of the Siberian city. Of course, research on urban development would be detrimental without this component. Even more so if it is a question of a region which is so intensely being developed by industry. The relationships in the "city--man--environment" system here are particularly complex, if we recall the increased vulnerability of nature, the unusual scale of the technogenic impact on it and the ecological ties which have been established over the centuries. On the threshold of the 21st Century there is no need to prove that the main evil is from the felling of the forests and not in the chips which fly off.... From these considerations, the ideas used in the work for the microzoning of the territories according to the ecological-urban development factors give great weight to the recommendations contained in it. The same thing can be said about the planning aspects for conserving the air basin of the cities.

The reviewed work is marked by an enviable soundness. This can be seen in the close knowledge of the initial network of population points, in the good mastery of regional problems and in the author's exhaustive amount of information on research being done on the forefront of a number of disciplines.

...Modern urbanization is a universal process appearing differently under various conditions of the natural and human environment. It is determined by a multiplicity of factors. A profound understanding of its patterns is all the more essential. The monograph by Ye. N. Pertsik analyzes the mechanism for the appearance of these patterns for the largest region of the nation the successes of which even now are adding to Russian might.

10272
CSO: 1820/1

ASPECTS OF LABOR QUALITY DISCUSSED

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[Article by N. Yu. Venevtseva, graduate student at the Leningrad Institute for Soviet Trade imeni F. Engels: "What Is the Quality of Labor?"]

[Text] A great deal is said and written about the quality of labor. Particularly in recent years. However, strictly speaking, a decision still has not been made as to just what this is. Philosophy explains the term "quality" as an essential definiteness, as a phenomenon, thing or process having its characteristics traits and features. Such an interpretation of quality can serve for delimiting the types of specific labor, for example, of a carpenter, metallurgical worker, weaver and so forth. The labor of each of these differs in terms of goal, the nature of operations, the subjects and means and in terms of the result.

But there is also another interpretation of quality. It is felt that this term expresses "the degree of perfection, a comparative characteristic (low quality, commercial quality) or an absolute characteristic (poor or good), a feature, basic data, parameters and so forth."[1] The given understanding is more suitable for judging quality in the production and technological sense. With good reason this has been adopted primarily by specialists in qualimetry. But it is too general and requires clarification in each specific instance whether it is a question of the quality of the product, the services for the public or, finally, of the labor.

It is not so easy to understand the posed question. Generally speaking, until recently the question of the quality of labor was posed only in relation to the allocation of national income.[2]

In speaking about the quality of labor, authors do not always point out in what aspect it will be examined: as a multiplicity of various types or within a certain type. Certainly a number of features which are essential in the first instance will not be able to be used at all in the second. Thus, I. T. Korogodin does not delimit the characteristics of heterogeneous labor and the quality of labor of the same type. He writes: "Two equal workers in terms of skills, the means and subjects of labor perform operations that are the same in complexity, but the results of labor will differ for them." Clearly it is a question of the quality of one type of labor (the internal differences are only in terms of the results). But then in the final definition the following characteristic is given for the concept: "The quality of labor is the aggregate

of quality properties of its elements and features, of the relationships which determine the nature, goal, degree of complexity and the result of the labor process aimed at creating a socially useful effect."[3] Here already it is a question of the labor of various specific types, each of which has its own definite aggregate of features.

The result (the degree of utility, the quality and quantity of consumer values and so forth) is so important a trait in the quality of a specific type of labor that it is a rare economist who does not mention this, but as a rule, on equal footing with other economic categories such as the complexity of labor, the skills of the workers, the labor and production conditions, the national economic importance of the sector, the intensity of labor and so forth.[4] These have remained from the time since the quality of labor was viewed exclusively from the viewpoint of the distribution relationships under socialism. B. K. Zlobin has written that for assessing the quality of labor, one must not limit oneself to the quality of the product, but it is also essential to know the specific labor and production conditions among which an important place is given to worker skills.[5] V. A. Levina and V. Ye. Shvets in their monograph on the principles involved in a comprehensive evaluation define the quality of labor by the skill level and the quality of the results, and in one instance they accept as the main one the actual conformity of the labor products to the established requirements and in another, the ability (qualification) and desire to create a high quality product but in no way not the result of labor itself.[6] Here there is a contradiction, an inconsistency in judgments. I. T. Korogodin, for describing the quality of labor, links the result with the complexity of labor, with the carefulness in using raw products and materials and with the broad introduction of advanced experience.

It is quite apparent that the designated features for the quality of labor are intertwined with one another in a complex manner. But ultimately, these features will find their expression in the result as in a generalized indicator of labor quality. Thus, if they are isolated, a certain circulation or double counting of the features is obtained in assessing the quality of labor. A double definition of the quality of labor is made by K. I. Kurovskiy in characterizing it by complexity, intensity (in which there is already an element of complexity) and by labor productivity.[7]

In all the works one is struck by the diversity of the conclusions and accentuations in defining labor quality. But all the authors speak about the importance and necessity of such a criterion as the result of labor. It can in no way be omitted, for logic itself and an analysis of the quality of a specific type of labor suggests this criterion. For an assessment of labor quality, its complexity, qualification, organization, the conformity of the expenditures of live and embodied labor, the saving of materials and raw products and much else will scarcely play the determining role if the very result of labor is absent or does not possess social utility.

When the quantity and quality of consumer values and the degree of labor utility are accepted as the criterion for the quality of a specific type of labor, this makes sense.[8] However, all of this applies to one of the areas in the study of labor quality, where it is viewed from the aspect of individual components or is identified with one certain main property.

Another area of research involves the characteristics of the quality of labor from the viewpoint of its conformity to certain previously established requirements. This has served as the basis for the rise of a system of labor quality control in which an

important place has been assigned to assessing the level of labor. The best known systems for assessing the level of employee labor quality are:

1) The system of flawless product manufacturing;

2) A system of flawless labor;

3) A universal automated system for inspecting execution and quality of employee work;

4) A system for a comprehensive evaluation of the results of activities. [9]

On a basis of a regular and thorough evaluation and inspection, all of these in principle should ensure the flawless execution of the functional duties assigned to the individual workers and collectives, including: the established operating conditions, the observing of the labor safety rules; the monthly work plan; the absence of product returns from the OTK [technical inspection section]; the absence of consumer complaints; the observance of production discipline and so forth. The difference between the designated systems consists in the degree of progressiveness of the indicators and the method for assessing labor quality.

For the system of flawless product manufacturing, the basic indicator is the level of products passing first inspection. In the system of flawless labor, the labor quality coefficient is calculated as the algebraic total of increase and reduction factors. The remaining designated systems are modifications (systems of flawless labor) which are more or less universal, with a different elaboration of organizational questions related to inspection of performance and an assessment of the quality of the work done by executors and their collectives. A system of indicators is formed for a numerical fixing of labor quality. The indicator is a quantitative expression of the properties of labor quality and its factors. A state standard sets such indicators as the percentage of the results of labor which pass inspection the first time; the percentage of the output of good products; the percentage of observing the parameters characterizing the controlled process; the quantity and importance of flaws in work; labor productivity; the indicators for the quality of the results of labor, in particular, the indicators for the quality of the product manufactured.

The level of labor quality is influenced by many factors which also have their indicators. Thus, as an indicator of labor complexity, the average work category, the degree of work precision and so forth may be used. The indicators of qualifications include the level of general and vocational education, the length of employment in the given profession, the worker's category, the length of employment in the given operation and so forth. The hardship of labor (in points), the category of job hardship and so forth provide a quantitative description of working conditions.[10]

In generalizing what has been said, it is possible to construct a system in which the basic views on the quality of labor, its definition and evaluation are classified. This classification makes it possible to see the great creative work which has been done by many production and scientific collectives of the nation in solving the questions of labor quality. At present, the concept of labor quality is employed rather frequently in the documents and decisions of various levels. We have wanted to show in our review that the very term "quality of labor" has more than one meaning and it must be employed

with an understanding of both the complexity and insufficient theoretical elaboration of this important concept.

FOOTNOTES

[1] A. Robertson, "Upravleniye kachestvom" [Quality Control], Moscow, Progress, 1974, p 5.

[2] "Trud i zarabotnaya plata v SSSR" [Labor and Wages in the USSR], 2d Edition, Moscow, Ekonomika, 1974, p 248; A. F. Razzhigayev, "Ekonomicheskiye problemy stanovleniya truda kak pobrebnosti" [Economic Problems in Establishing Labor as a Need], Moscow, Mysl', 1977, pp 30, 40.

[3] I. T. Korogodin, "Labor Quality: Content, Categories," EKONOMICHESKIYE NAUKI, No 11, 1978, pp 13, 15.

[4] T. A. Polezhayeva and V. I. Razin, "The Essence and Characteristic Traits of Labor Quality," "Sotsial'no-ekonomicheskiye problemy truda v razvitom sotsialisticheskom obshchestve" [Socioeconomic Problems of Labor in a Developed Socialist Society], Kuybyshev, 1979, p 124.

[5] B. K. Zlobin, "Sotsial'no-ekonomicheskiye problemy povysheniya kachestva produktsii" [Socioeconomic Problems in Improving Product Quality], Moscow, Profizdat, 1977, pp 42, 43, 60.

[6] V. A. Levina and V. Ye. Shvets, "Printsipy i metody kompleksnoy otsenki kachestva truda v promyshlennosti LatSSR" [Principles and Methods for a Comprehensive Evaluation of Labor Quality in Latvian Industry], Riga, LatNIINTI, 1979.

[7] K. I. Kurovskiy, "Problema izmereniya kachestva truda" [The Problem of Measuring Labor Quality], Moscow, Ekonomika, 1977, p 36.

[8] V. N. Belkin, "Povysheniye ekonomicheskoy i sotsial'noy effektivnosti truda" [Increasing the Economic and Social Effectiveness of Labor], Moscow, Ekonomika, 1980, p 187.

[9] B. A. Dubovikov, "Osnovy nauchnoy organizatsii upravleniya kachestvom" [Principles for the Scientific Organization of Quality Control], Moscow, Ekonomika, 1966.

[10] V. N. Basin, "Opredeleniye stepeni vliyaniya nekotorykh sotsial'no-ekonomicheskikh faktorov na kachestva truda rabochikh" [Determining the Degree of Impact of Certain Socioeconomic Factors on Employee Labor Quality], Riga, LatNIINTI, 1980, pp 5, 6.

10272
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