USSR

EDUCATING SCIENTISTS

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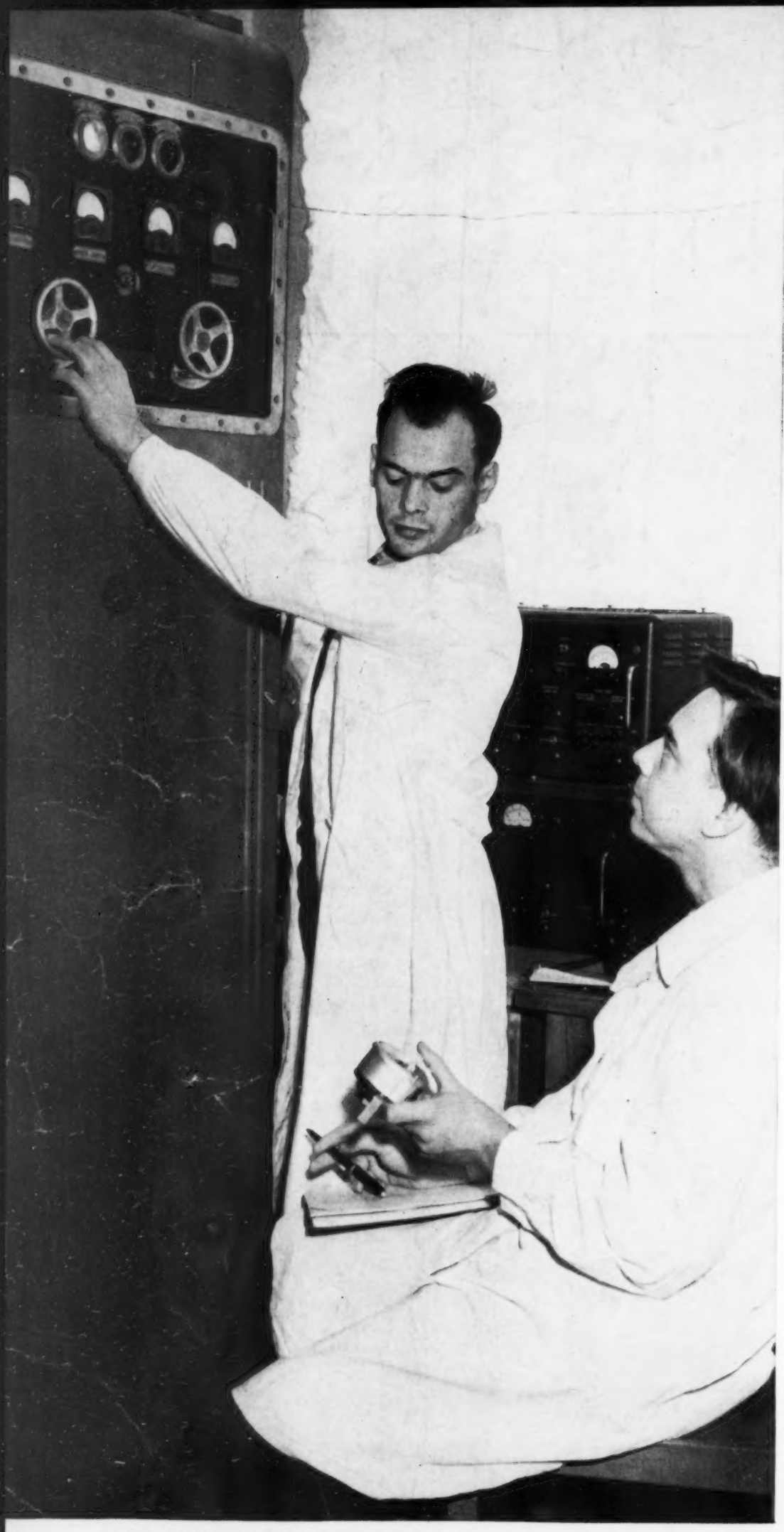
No. 2 (17)—20 Cents



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USSR

ILLUSTRATED MONTHLY
1706 Eighteenth Street, N.W.
Washington 9, D. C.
ADams 2-3426

The magazine *U S S R* is published by reciprocal agreement between the governments of the United States and the Soviet Union. The agreement provides for the publication and circulation of the magazine *U S S R* in the United States and the magazine *Amerika* in the Soviet Union.

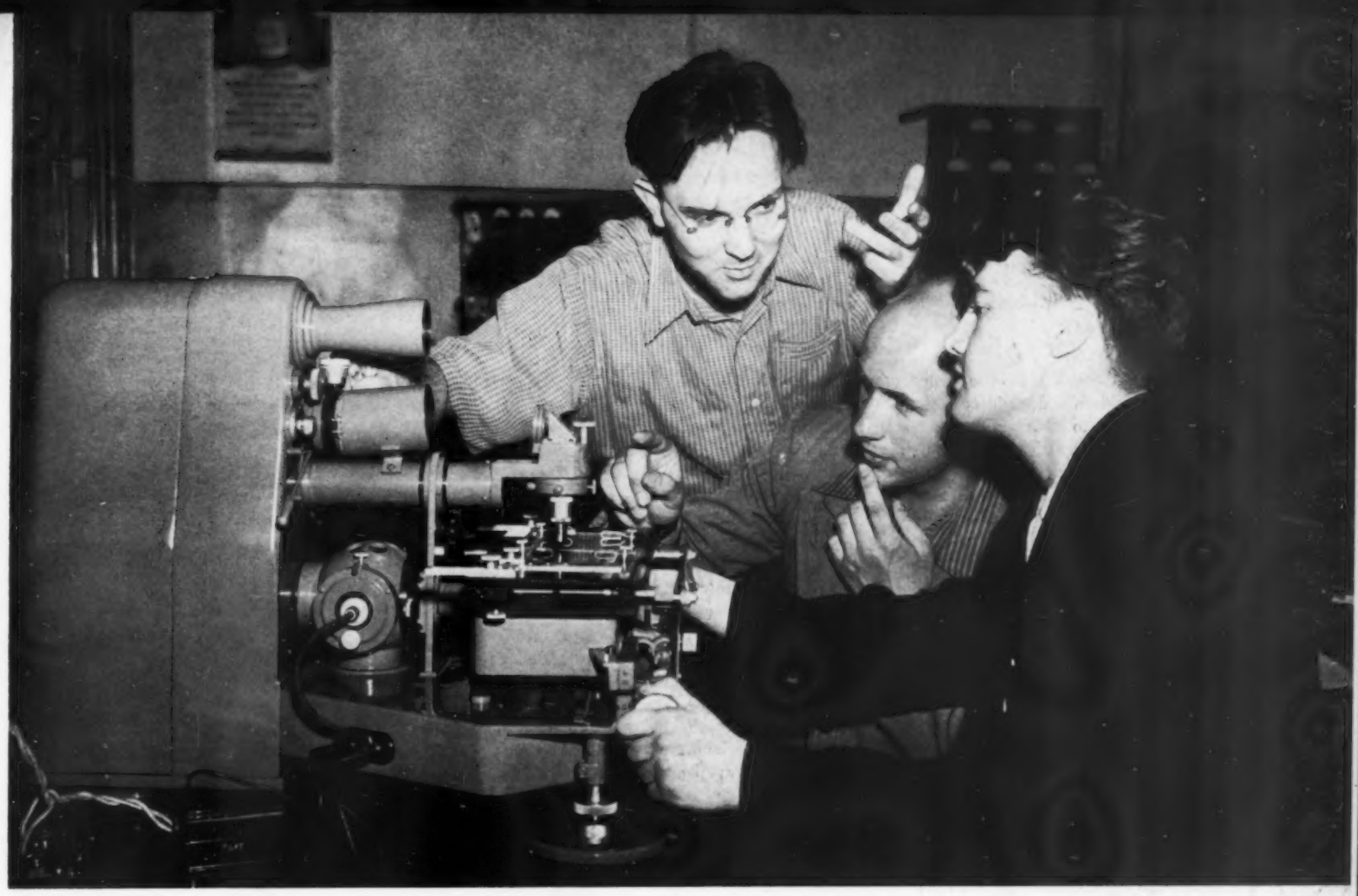
Front cover: Anatoli Dmitrovsky, on the staff of the Biochemistry Institute of the USSR Academy of Sciences, typifies the country's younger generation of scientists.

Subscription Rate:
6 Months $1.00
1 Year 1.80
2 Years 3.00

Published by the Embassy of the Union of Soviet Socialist Republics in the USA.

Second Class mail privileges authorized at Washington, D.C., with additional entries at Milwaukee, Wis., and Chicago, Ill.

Printed by The Cuneo Press, Inc.



TRAINING SCIENTISTS

By Vyacheslav Yelyutin, *Minister of Higher Education*

THE ATTENTION which science education receives and the high regard in which scientists are held in our country is not of recent origin. It is as old as the Soviet Union itself. And reasonably so, since the utilization of modern scientific findings is a fundamental part of the Soviet system, of every aspect of the country's life. Scientists, therefore, have a limitless horizon of activity and are given every opportunity for research and unstinting funds and equipment to carry on their work.

We assume as a requisite for continuing economic expansion and social progress a highly literate population from which new creative scientists may be drawn. Fifty million people—one-fourth of the country's population—are studying in one or another of the elementary and high schools, specialized secondary schools, colleges and universities, in vocational schools or at on-the-job training courses.

Education from elementary school through college and graduate work is financed entirely from the national budget and is free to all students. The budget for public education has increased with each passing year. In the five years from 1953 to 1957 alone it grew from 61 to 79 billion rubles a year.

Soviet education operates on the premise that the future scientist must have a rounded background. The secondary school curriculum, mandatory for every student regardless of future specialization, includes study of the humanities as well as science and polytechnical training. The program is uniform for all schools and fulfills the general requirements for entrance into any of the country's colleges.

The Secondary School

The science course covers mathematics, biology, physics, chemistry and astronomy. It takes in both the theory and general laws of the science and is correlated with laboratory study and excursions to neighboring farms, factories, museums and exhibits. Among other things, the secondary school course is designed to provide each student with a basic general background in science, to acquaint him with the various fields of knowledge so that he may be equipped to select the work he wants to pursue, to foster independent thinking and working habits and to develop potential skills.

From high school the student may go on to advanced study at a specialized secondary school or college. Or, if he wishes, he may begin to work at a job for which his knowledge and preparatory polytechnical training in high school will have given him the basic background.

Potential skills and talents are carefully noted and helped to develop

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by teachers through classroom work and extracurricular clubs and circles. Neighborhood children's clubs, with their rich program of activities geared to stimulate the interest of every youngster, search out and direct talents which otherwise might go to waste.

A close tie is maintained between the secondary schools and the colleges and scientific institutes, with activities scheduled to foster latent abilities and to direct students to those fields of specialization for which they manifest interest and aptitude.

The Moscow State University, for example, holds an annual city-wide mathematics contest for secondary school students. This is an event of general interest preceded by lectures given by nationally known mathematicians and model assignments published in the press. The winners of the competition are awarded prizes.

The physics department of the Tbilisi Engineering Institute has been working with the city's secondary school pupils for some years now. The Institute professors lead specially prepared discussions in mechanics, molecular physics, electricity and optics, with appropriate laboratory demonstrations. The discussions are lively and almost always lead to consideration of science careers.

Contests and discussions are held in most fields of study—literature, languages, geography, the sciences. For the students who participate they provide a broader insight into a particular field of study and a test of abilities more demanding than that of the classroom.

During "Open Door Days," secondary school students are invited to visit the colleges and universities. The Leningrad Mining Institute "Open

Seventh-grade physics class in a Moscow secondary school. Soviet pupils are given a good grounding in the sciences as well as in the humanities.

Physics experiment by Armenian girls in a Yerevan secondary school. Work in the laboratory supplements the theory that is learned in the classroom.

Fifth graders in a botany class. This introduction to science coupled with the after-school scientific clubs led by teachers quickens the pupil's interest.

A lesson in electricity for tenth graders. Secondary school laboratories are equipped to provide the students with the solid background colleges require.

"Open Door Day" at the Siberian Timber Institute in Krasnoyarsk permits the transport department to show its laboratory to new high school graduates.

Door" program is fairly typical. The young visitors gather in the auditorium where the Institute director talks on the history of the school and its admission requirements. Then the heads of various departments describe their specialties. After this the students tour the school and ask questions, both general and personal.

College Education

Thus, to a large extent, the secondary school provides the basic elements for a career in science. College training develops these elements and brings them to maturity. The country's constant need for specialists, the availability of facilities and the consideration shown serious students are an incentive for young people to continue their education beyond high school.

For college entrance, the secondary school graduate must pass uniform competitive examinations in Russian language and literature, in one foreign language and in subjects pertaining to his chosen field. A future engineer, for example, will be required to pass examinations in mathematics, physics and chemistry; a medical student in physics, chemistry and biology.

The course of study ranges from four to six years, depending upon the field of specialization. The academic year begins on September 1 and ends on June 1, with a two-week winter vacation and a two-month summer vacation. Examinations are held between terms and at the year's end. Attendance at classes and lectures is compulsory. Twenty is the normal class size.

Tuition is free, and students who show good progress in their studies are given a monthly allowance by the government. Last year 79 per cent of all the country's students received such stipends. Textbooks are provided for the course without charge. Books in general are very inexpensive and any student who prefers to have his own personal collection can easily manage to buy what he wants from his stipend. Out-of-town students are boarded in college dormitories and have their meals at college restaurants at very moderate cost.

Generous budgetary allocations are made for college and university libraries, laboratories, scientific equipment and whatever else is required

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Alexei Tishenkov attended evening high school while working on a farm. After graduation he enrolled at the Moscow Agricultural Academy.

Chemistry lab for secondary school youngsters. Colleges keep in close touch with schools and help direct students to careers which they most desire.

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to turn out well-trained graduates with a rounded general education.

Striking evidence of the great spread of higher education is the fact that all of the many peoples in our country, some of them primitive nomands before the October Socialist Revolution of 1917, now have their own scientists, trained in their own colleges and universities. In that great area which is now the Byelorussian, Lithuanian, Moldavian, Azerbaijan, Armenian, Kazakh, Uzbek, Turkmen, Tajik and Kirghiz Republics, there was not a single school of higher education in prerevolutinary times. Today these republics alone have 152 universities and colleges with 320,000 students enrolled. Of course, many additional thousands of students from these republics are enrolled in colleges all over the country.

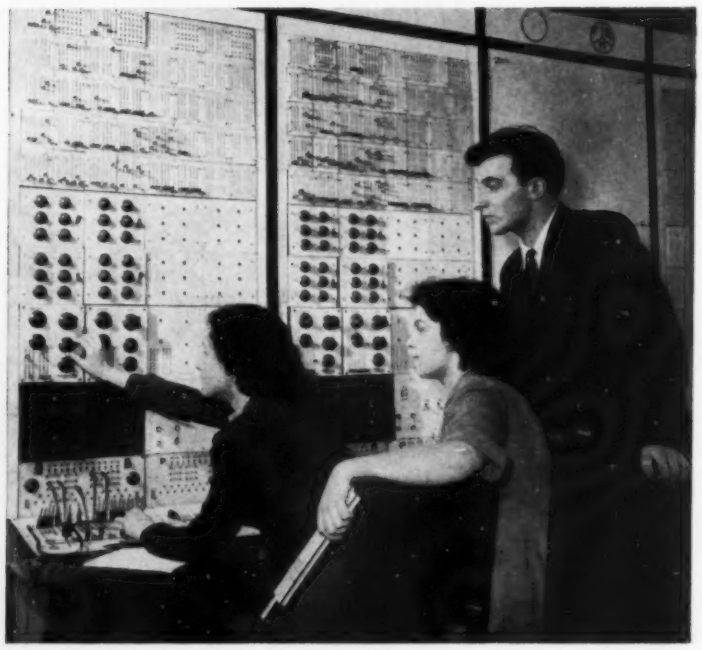
It is worthy of note that by comparison with 1928, when only 28 percent of the students in colleges were women, the fiugure has now jumped to 50 per cent. In professional schools for the training of physicians. teachers, artists, musicians and writers, 70 per cent of the students are women. It would follow that the number of women scientific workers has also increased. At present it is 36 per cent of the total.

In addition to full-time schools, there is an extensive network of evening departments of colleges and universities. In many cases they function directly at plants and factories and provide the same course of

Alexander Nesmeyanov, President of the USSR Academy of Sciences, is among the many leaders of science who regularly lecture to university classes.

Geology class of an agricultural institute in North Ossetian Autonomous Republic. High academic standards are uniform throughout the Soviet Union.

The petroleum department of the Ashkhabad University in Turkmenia. Each national republic now has its own native-staffed scientific institutions.

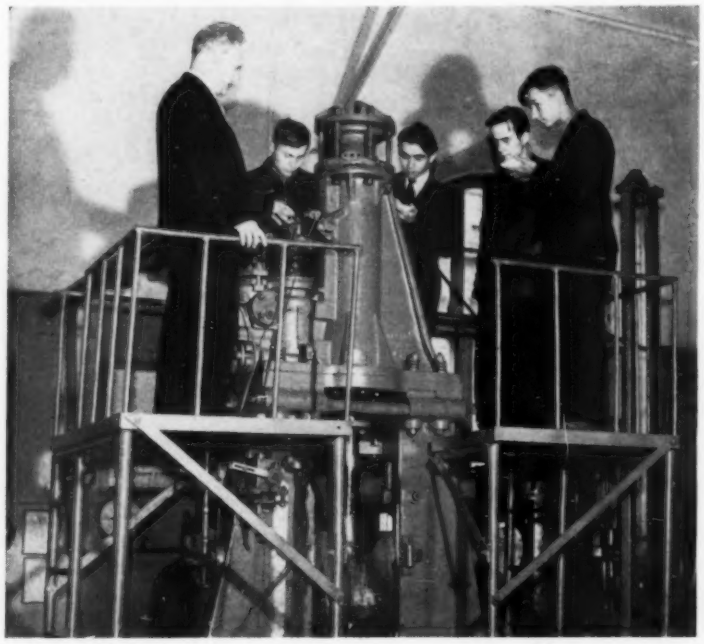


Moscow Power Engineering Institute students use computing panel to solve operational questions. The latest machines are available to all students.

Students of industrial crops department of the Byelorussian Agricultural Institute check in the laboratory what they have learned at lectures.

Lecture on anatomy in the Azerbaijan Medical Institute. Attendance at all classes and lectures is mandatory for completion of undergraduate courses.

Radio laboratory in the Uzhgorod State University in Transcarpathia. All colleges and universities exchange ideas and experience with each other.



The class work of senior students is supplemented by on-the-job training. Factory visits start the first year and are continued until they graduate.

study as day school. There are also correspondence institutes that maintain consultation centers and libraries at industrial establishments in many cities where the worker-student may consult with instructors and attend lectures and lab classes. These centers also check tests, supervise students' projects and give examinations.

People enrolled in correspondence and evening courses are given an additional vacation of 20 to 30 days with pay by their place of employment to enable them to take their examinations. They are excused from work for four months to prepare their thesis and are also given a month off to take state examinations. During all this time they receive a state stipend.

The overwhelming majority of correspondence students take courses in line with their vocation. Thus, this type of educational institution is able to graduate specialists who can immediately occupy leading posts in production.

The College Curriculum

The function of college is to equip the student with a necessary body of theoretical and practical knowledge, to supply him with the tools for independent learning and research and to develop his capacity to think creatively.

The curriculum covers the sciences and specialized courses. In addition all students are required to take political economy and philosophy, which cover both Marxist theory and a study of classic and contemporary schools. Science students are encouraged to attend lectures in the humanities but are not required to pass examinations in these courses.

Teaching is done through lectures, laboratory work, practical exercises, term projects, thesis project and independent work. The lecture is the basic method of teaching, complemented by independent laboratory work under the instructor's guidance. Each college works out a

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Advanced medical students assist surgeons in the operating room as others look on. Following a case so closely gives them much valuable experience.

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program of on-the-job training for its students at industrial or agricultural establishments, hospitals and the like. This is to acquaint the student with his specialty in practice and to permit him to apply the theory which he learns in class.

In addition to the faculty, outstanding people in various fields—science, industry, agriculture—are called upon to lecture and lead class discussions in order to integrate theory with practice. This integration is a vital part of the teaching process in all Soviet schools.

The course of study varies with the specialization but is uniform throughout the country for any given field. In a technical college, for example, it includes physics and mathematics, general engineering and the social sciences, organized to give the future engineer a solid background in his field plus a rounded general education. The subjects are grouped as follows:

Basic subjects which must be taken by all enginering students regardless of their specialty: mathematics, physics, chemistry, mechanics, descriptive geometry and drafting, technology of metals, social and economic sciences, a foreign language and physical culture; a group of subjects determined by the particular specialty; a group of elective courses.

Practical exercises are given in mathematics, theoretical mechanics, the theory of mechanisms, strength of materials and similar subjects to test the application of theory and to accustom students to solve problems independently.

Term projects will usually represent the student's first major effort to apply his theoretical knowledge to a practical engineering problem. The project is prepared independently, with the instructor available only for consultation. The student will ordinarily have completed

Physics students of Kazan State University in Tatar Autonomous Republic. The colleges, as well as research centers, conduct serious research work.

Geography students of Moscow University accompany scientific expeditions far from the campus. Actual field work is incorporated in all the courses.

Nuclear physics students at the Moscow Power Institute. More specialists are continually needed to fill jobs created by latest technological gains.

Members of a student scientific society at the Byelorussian Agricultural Institute. Extracurricular development plays a major role in education.

Ukrainian astronomy students study oscillogram of a Sputnik's signals. Students are kept fully informed of all current developments in research.

several term projects during his college course—on machine parts, in general engineering and in his specialty.

On-the-job training is an organic part of the teaching process. Skilled engineers, Soviet education says, cannot be trained solely within the confines of the college. However well-equipped the laboratories, however intimate lecturers may be with practice in a given field, it is impossible to train skilled engineers capable of adjusting to the changing needs of industry, construction, transport and agriculture without the direct participation of the student in the production process itself.

Training is not confined to the narrow craft skills, however. Its purpose is to give the student an engineering approach—a scientific approach—to problem-solving. In addition to its very great educational value, practical training has certain important moral values, since the student makes the transition from unskilled worker to skilled worker to engineer by proving himself competent to face real job situations. On-the-job training is usually confined to senior students, although visits to factories start in the freshman year.

In all colleges independent research work done by students under faculty guidance is one of the most important elements in the educational process. Independent work is fostered through student scientific societies. Problems of great theoretical and practical value have in many instances been solved by student research.

Annual conferences are held at the colleges at which student papers are read and discussed. City-wide scientific conferences review the best student papers for awards and certificates of merit. Nation-wide contests are held each year for the best scientific papers submitted by students. The winning papers are published and prizes awarded.

Work on the graduation project, or thesis, will conclude the student's college training. Some specialties—medicine, for example—require state examinations instead of a thesis. Some require both. The project

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Applying science to soil fertility is being tackled by these postgraduates of the Agricultural Research Institute in the Latvian capital city of Riga.

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or thesis must be defended at a public convocation before an examining committee composed of the dean, professors and specialists in the field dealt with in the thesis. After defense of his thesis, or upon passing the state examination, the student is awarded a diploma of higher education.

Graduate Work

More than 6,000,000 specialists—engineers and technicians, agronomists and veterinaries, teachers and physicians, artists and writers—are now employed in the country. More than 4,000,000 students are being trained in colleges, universities and specialized secondary schools.

The number of persons with a higher education is constantly increasing. Before the war 109,000 specialists were graduated from the colleges each year; in the past two years the number increased to 259,000 a year. This is the group which is mainly drawn on for subsequent training of scientific personnel.

The best of the college graduates are admitted to the three-year graduate course leading to the Master of Science degree after they have had some years of practical work. Only in exceptional cases is the practical experience requirement waived. Students with a *cum laude* diploma may be accepted for graduate study in some theoretical fields directly after they graduate from college. Graduate work can also be done through evening divisions and correspondence courses.

Graduate students receive a monthly stipend from the government and an additional sum for the purchase of scientific literature. The stipend continues through the two-month summer vacation. Up to three months' paid leave is granted people who intend to submit their Master's thesis without discontinuing work.

To qualify for a Master's degree a candidate must pass examinations in four subjects: a subject in general theory that relates to his specialty; a subject related to his dissertation; a foreign language; philosophy. His dissertation must give evidence of thorough grounding in his field and must indicate a capacity of independent research.

To qualify for a Doctor of Science degree the candidate must hold a Master's degree and publish a dissertation which makes a new and significant contribution to the solution of an important problem in his field of study.

The thesis for both Master's and Doctor's degrees must be defended publicly before one of the scientific councils, which casts its vote for acceptance or rejection by secret ballot.

The Soviet Union has 240,000 scientists and college instructors, with 100,000 holding the degree of Master of Science and only 10,000 with the degree of Doctor of Science. It is evident that the higher degree is conferred only for distinguished scientific work.

Most scientists and educators obtain their graduate training in the universities and colleges. A considerably smaller number do their graduate work in the USSR Academy of Sciences, the Academies of Sciences of the Union Republics and the specialized research institutes. More than 18,000 students are now doing graduate work, with an annual 3,500 completing the requirements for advanced degrees.

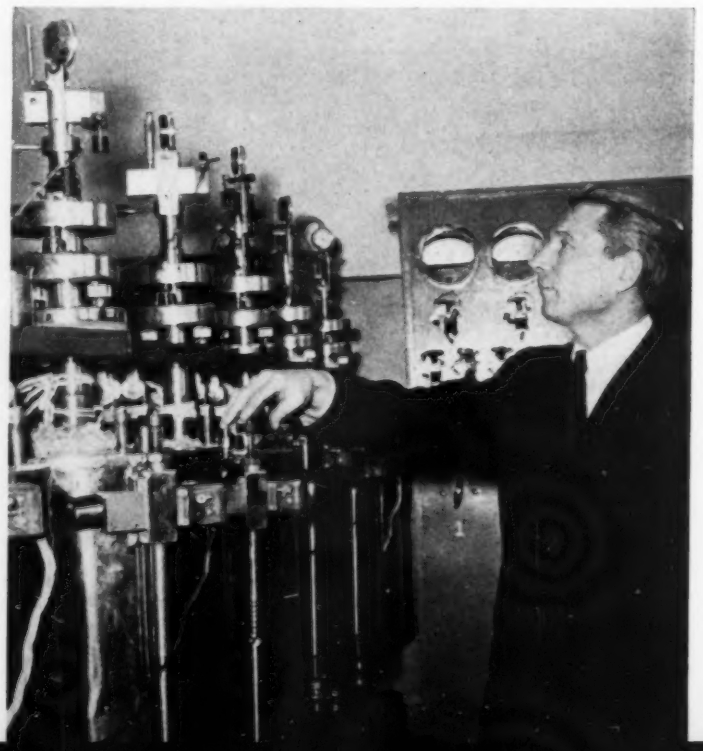
The great extension of higher education is best illustrated by comparing the fourfold increase in the number of workers and employees in the past 40 years with the 20-fold increase in the number of college-trained specialists and the 24-fold increase in the number of scientists with graduate degrees. The number of workers in the USSR Academy of Sciences alone has doubled in the past five years.

The increase in the number of scientists has been achieved by drawing the youth into science. The average age of workers in the USSR Academy of Sciences has decreased from 41 to 38 years, and among the Doctors of Science, the corresponding members of the Academy and even among the Academicians, we now find many young people, talented and well trained. Some of the leading institutions are predominantly staffed by young scientists, 50 to 85 per cent of them under 30.

A professional scientist, a young engineer and a veteran mechanic team up to collaborate on a project. This type of cooperation is common practice.

Women comprise 36 per cent of the country's scientists. Here are researchers in the Institute of Biology of the Armenian Academy of Sciences.

Like many other industrial workers, mechanic Nikolai Zaitsev took correspondence courses and graduated into scientific work through extra study.



Six million specialists are employed in the country, with four million more being trained in colleges and specialized secondary schools.

An Uzbek scientist works to improve native cotton. Scientific problems which are local in scope are usually solved at centers in the respective area.

New Tasks

The rapid development of the national economy and the tremendous growth in college enrollment have created problems which are now in the process of being solved. One involves directing students into fields of study which will culminate in specializations needed by the country. Another involves training professors and teachers who will be adequate to their task in both number and quality.

Of the total number of specialists graduated from schools of higher education, 37 per cent are trained for industry and agriculture; the remaining 63 per cent have majored in economics, law, education, medicine, art and other professions.

In recent years we have had an increase in the number of engineering graduates which testifies to the great spread of technical education. In 1950 there were 392,000 graduate engineers employed in the country. Today there are 721,000. But even this increase has been insufficient to meet the great demand of industry for trained personnel.

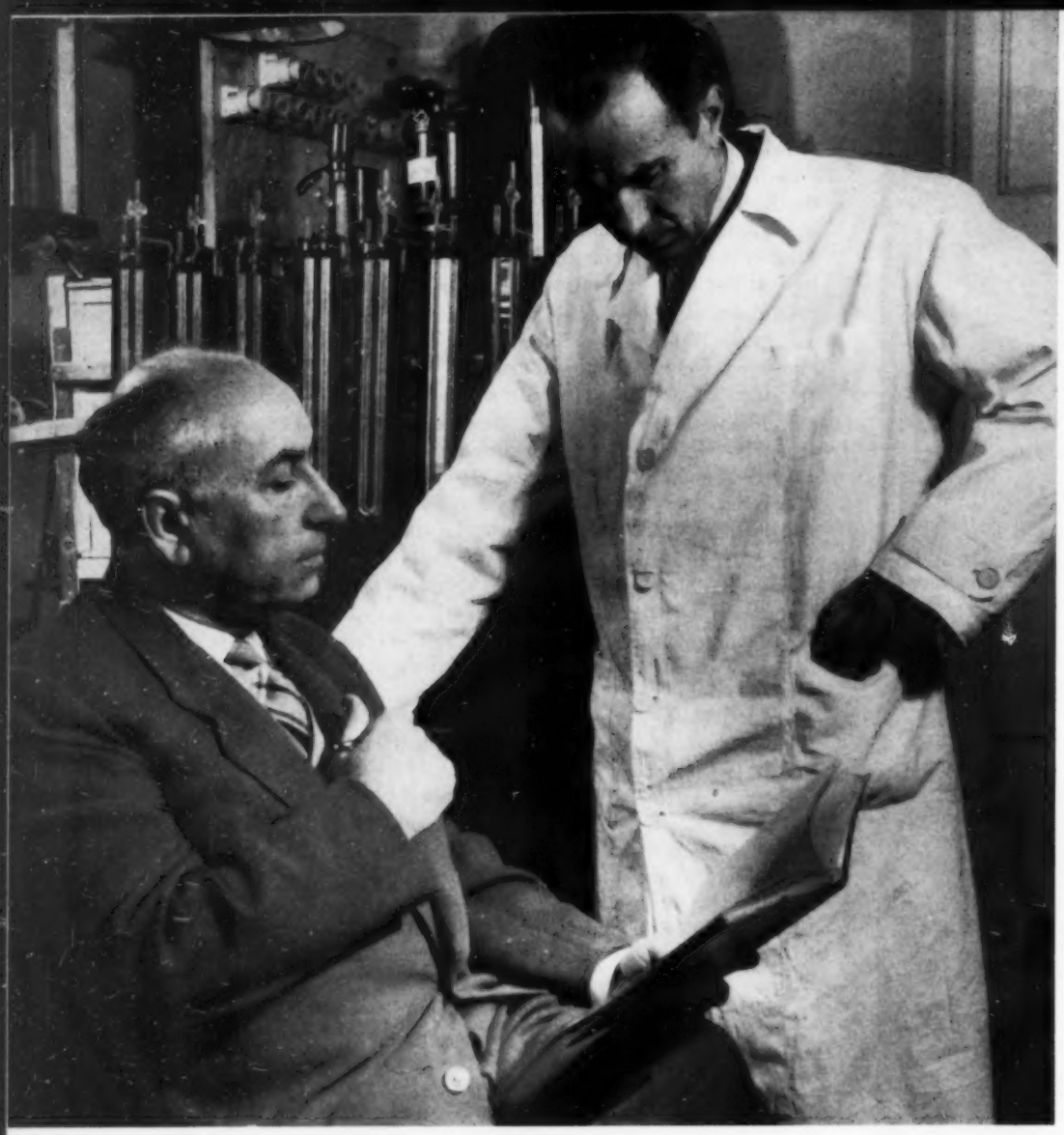
In order to train the numbers and kinds of specialists the country requires during a given period, it is necessary to keep in touch with all branches of the national economy and achieve a spread that will meet its needs and avoid disproportion. The major emphasis at present and for the foreseeable future, in view of the growing place which science occupies in our modern society, is for training in physics, mathematics, chemistry, biochemistry, biophysics, aerodynamics, automation, radio-engineering, electronics, semi-conductors and some other new areas of science and technology.

Comprehensive examinations for admission to the technical colleges objectively select the best of the applicants. The wide diversity of choice of specialty and of job possibilities in the country does much to avoid over-concentration in any one area. And the careful concern of vocational guidance agencies to direct secondary school graduates into specialties which they will find rewarding and which will tap their latent resources helps in large measure to avoid imbalance. But the basic guide must be this one: to direct the student into that field of work in which he himself feels he will be happy. That is the best guarantee for effective and creative work that will at one and the same time develop the individual and contribute to scientific and technological progress.

As for the problem of training the personnel that will train our scientists, we feel that only the teacher who himself contributes to the development of science has a moral right to teach in college. Scientific work is the principal condition for the training of scientists and for raising their qualifications. That is why college instructors and professors must participate in scientific work. In the final analysis it is they who hold the key to the fullest development of higher education, the training of scientists, and even science itself. ■

Boris Paton, renowned scientist in the field of electric welding, heads a Kiev institute. Special research centers are set up for specific problems.

Abram Joffe, 77-year-old head of Institute of Semi-Conductors, has trained a whole galaxy of scientists. Teamwork unites the young and old scientists.



SISAKYAN (LEFT) IS WORKING ON CONTROLLING THE RESISTANCE OF PLANTS TO HEAT, COLD AND DISEASE.

EDUCATION of a BIOCHEMIST

By Oleg Pisarzhevsky

ONE of the ornate halls of the USSR Academy of Sciences in Moscow, decorated in the flamboyant taste of the last century, was the setting for an international scientific congress on the origin of life held not long ago. Principal speaker at this symposium was the distinguished Soviet biochemist Norair Sisakyan, a member of the Academy and chairman of its international science exchange committee.

Sisakyan is an Armenian by birth, his ancestry marked by his speech and his effervescence. Otherwise he is the internationally-minded Soviet scientist of today. He is in his middle years, his hair touched with gray. Listening to him, one was struck by the curious disparity between the speaker and the tarnished gilt nineteenth century setting. And yet the setting was not far out of character, a reflection of the telling changes the past four decades have brought to the man, to his native Armenia, and to the world of science.

Sisakyan's own life is a comment on these changes. To visit his birthplace one would have to travel to the great Caucasian mountain ranges beyond the Black Sea in the remote southeast. It is a verdant land now—of crystal-clear mountain lakes, flowering pastures, fertile fields and fruitful orchards. It was an impoverished land in 1920, village and town ruined by civil war and foreign invasion.

Norair wanted desperately to study, but there was the more pressing necessity of a livelihood. He worked with his father in the fields, dreamed of school and study.

Through an older friend he learned of a study circle led by a university student, Ezras Asratyan. The university student later became a disciple of Pavlov, the great physiologist; now he is a professor and corresponding member of the USSR Academy of Sciences. Asratyan used to lead the study circle when he came home on holidays.

Norair was one of the most faithful members of the circle, but when it was finished he had neither the means nor the possibility of continuing his studies. Then a scholarship fell vacant in a school the government had founded for young people who had missed out on schooling. Sisakyan passed the entrance examinations and was admitted to the senior class.

The school emphasized science, and for the first time Norair looked into a great new world—the world of botany and biochemistry.

It was very early in his life, while studying at the village school, that Sisakyan voluntarily assumed the job of teacher. He led a study circle for illiterate young people. It was his way of reaching out a helping hand to others, a debt he felt he owed.

After completing the village school, he took the entrance examinations for the university, then newly founded in Yerevan, capital of the Armenian Soviet Republic, and won first place.

The best of the university students were then sent to Moscow for advanced study. He was one of the four chosen. Three of the four, Sisakyan included, spoke only Armenian, they knew no Russian. The Moscow professor of chemistry was unaware of this and early in the semester, after explaining an intricate reaction, he happened to call on Sisakyan to recite the sequence of formulae.

"Tell him," said Sisakayan to the single 'interpreter' in the group, "that I understand everything he wrote on the blackboard, all the formulae, but I can't speak Russian. Ask him if it's all right for me to write the reaction out on the board without speaking."

The professor nodded and Sisakyan proceeded to chalk up formula after formula. It was a brilliant, if silent, recitation.

"But you must know the language," the professor told him. "You can't go very far with the blackboard alone."

Sisakyan turned to the interpreter again. "Tell him that I intend to speak without an interpreter by the end of the semester." He did—in three months.

When he had finished the university course, he was invited to do graduate work at the Agricultural Academy under the agronomist Dmitri Pryanishnikov. Pryanishnikov was an old man, a distinguished scientist, one who abhorred the stereotyped and the dogmatic, was impatient with mediocrity, uncompromising in the search for the truth of science. In the short time he worked with Pryanishnikov, Sisakyan absorbed the old man's dedication to principle, his conception of nature as one great interdependent entity.

The young scientist went to work on enzymes, complex organic substances that act as catalysts in chemical changes that animals and plants undergo. At that time there was little known about these agents.

Sisakyan called them the springs of life, since without their action such elemental processes as digestion of food could not go on. These enzymes break down the complex molecules of albumen and other food components into simpler substances that the body can assimilate.

Sisakyan's research disclosed the function of these agents. His theoretical findings have had large practical significance. Through selection of fertilizer, the sugar content of beet plants can be increased; the proper fertilizer influences the enzyme that accelerates sugar production in the plant. His findings have been applied to the complex enzymes in flour, tea, wine and other foodstuffs.

Even the most highly theoretical of Sisakyan's experiments somewhere border on problems of vital and immediate practical interest. By study of the mechanism through which enzymes alter plant activity, he hopes eventually to grow plants artificially, not through slow selection and breeding but by direct alteration of the chemistry of their life processes, and thus to control such vital growth factors as early ripening, sugar content and resistance to drought. The work under way now in Soviet biochemistry is rapidly making the hope a reality.

Sisakyan's latest work, *The Biochemistry of Metabolism*, published by the USSR Academy of Sciences, repeatedly stresses the idea that biochemistry has advanced to the point at which it is possible to establish the chemistry of all the various phenomena which characterize the life process. It may be that this rapidly developing field of science will some day give us the biochemical clue to the creation of life itself.

Sisakyan's laboratory in the USSR Academy of Sciences has become a veritable school for training biochemists. These young people, with their university and graduate study paid for by the government, with the monthly stipend they receive for living expenses, have a much easier time of it than did the student of Sisakyan's youth.

Relieved of financial concern, they are able to devote themselves entirely to study and research. The scientific talents of such brilliant students of Sisakyan's as the young Byelorussian Alexander Vecher, the Georgian Georgi Beridze and the Russian Ivan Yegorov were fostered in this favorable climate. Vecher is professor at the Krasnodar Food Industry Institute. Beridze is director of the Institute of Wine Making and Viticulture in Tbilisi. Ivan Yegorov comes from the new generation of Sisakyan's students. He is working on the chemistry of wine. Irina Philippovich is doing research on the synthesis of albumen, and Nina Vasilyeva on the chemistry of the cell nucleus. Both problems are important for modern genetics.

With the young and promising biochemists of Armenia—Babken Afrikyan, Galust Sadunts, Rosalia Saakyan and many other of his pupils —Sisakyan maintains especially warm and close ties. For him these young scientists embody the transition his native land has undergone in these forty short years. ■

Sisakyan in the study of his apartment. Currently he is doing research to establish the chemistry of phenomena characterizing the life process.

Schoolboy Alexei collects badges aided by his father and his elder brother Yosif, who has now embarked on a scientific career as a physics student.

DMITRI SHOSTAKOVICH (RIGHT) GETS OVATION WITH CONDUCTOR YEVGENI MRAVINSKY OF THE LENINGRAD ORCHESTRA AT THE CONCLUSION OF THE SYMPHONY'S PREMIERE.

The Symphony of the 1905 Revolution

The Shostakovich Eleventh

By Marietta Shaginyan

THE new Shostakovich symphony, his eleventh, had its premier in Leningrad in November during the 40th anniversary celebration of the founding of the Soviet state. The theme of the symphony is the 1905 Revolution.

An unusual solemnity attended the performance. In the audience were people who had marched to the Winter Palace on that tragic January 9, with thousands of other workingmen, to petition the czar for bread. The czar replied with bullets that slaughtered a thousand defenseless people. The city answered with an uprising that was crushed by czarist troops. It was a bloody dress rehearsal for the 1917 Revolution.

The new symphony is in four movements. The first movement Shostakovich calls "The Palace Square," a musical arrangement of forces about to clash. The melody is evocative. It is a slow adagio, familiar but ominous. Memory turns back to 1905. Leningrad is once again old St. Petersburg. It is your native city, but you are not at home in it.

There is an oppressive feeling in the winter air on this early

morning. The palace square is empty, silent, shut off from the people, from you, by the iron gates, by the iron-faced sentry in his striped box, by the ox-eyed beefy policeman with his fixed stare. The precise step of a platoon marching is heard somewhere in the distance, and the sound of church bells—not mellow and rich, but thin and scraggly and disquieting.

This is the picture evoked by the opening phrases. In the same way that the hollow march-like theme from his Seventh Symphony has become inextricably associated for listeners with the fascist invasion during the Second World War, so will this long adagio become one with our recollections of czarism—an autocracy which holds this Russian city in its moribund clutch, disfiguring and deforming the people who had created the severe beauty that is the city.

But imprisoned beneath the adagio you hear the sounds of the city. The flutes pick it up, a simple melody that is not ashamed to be beautiful sings above the frozen desert of the dominant notes. Although this melody springs up unarmed, seemingly defenseless against the dead hand of negation—and this always happens with Shostakovich, his great human sympathy translated by great musicianship—the music develops his theme polyphonically to convince us of the inevitable and triumphant strength of this subdued melody.

The Positive in Shostakovich's Music

If I may be permitted to digress for a moment, it seems to me that those critics who hold that the "negative" in Shostakovich's music is developed more strongly than the "positive," are mistaken. Shostakovich's distinguishing quality rests not so much in the color of his melodies as in the unique way in which he develops his themes, in the originality of his "syntax," if I may compare music with language, the harmonious structure that he develops.

The character of this development, the way in which Shostakovich unfolds the entire potential of his musical thought, is so logical, so vigorously positive, that in any Shostakovich theme, even one which translates sorrow or death, the musical whole is profoundly optimistic, strengthening, inescapably positive.

In the Seventh Symphony, for example, victory, the epitome of the positive, is not merely expressed in the last movement, it arises out of the development of the negative theme of fascism. In the Eleventh Symphony, too, the positive, optimistic transformation of the second movement develops out of the tragic theme of the people shot down.

Slowly we hear—and see—the unarmed people gathering in the palace square. They carry icons, flags, pictures of the "little father," their czar. From inside the palace walls we hear the beginning of another slow theme. The people are unarmed, but there are many of them, and the number grows irresistably. The slow theme develops, grows. Fear of this living, moving mass penetrates through the gates, into the palace, into the heart of the regal butcher cringing against the richly tapestried walls. The shots ring out, the people fall, the square strewn with bodies, the quietness broken by lamentation.

Now, like a giant organ played by a Bach, the fugue rises above the tumult and the grief to proclaim the doom of the royal murderer. The heavy notes fall one by one, implacable as the future, passing the judgment of history on this regime of blood and of death.

A Revolutionary Requiem

The third movement begins with a compassionate funeral march derived from the revolutionary song, "You Fell in a Fatal Struggle." Shostakovich, who always quotes with great economy and then quickly transforms the melody he uses, seems here to be unusually deliberate and detailed. It would seem to me that he is pointing to the unique difference between this requiem and the classical funeral march.

Recall the sorrowing strains of Chopin or the repressed grief of the allegretto, the second movement of Beethoven's Seventh Symphony, so often played at funerals. The major theme is heavenly resurrection, a recognition of life on earth as transitory. But the grief in the revolutionary Russian song is a call to the living, not resignation to death's inevitability. It is a vow made to the dead that the struggle they fell in will be carried forward by the living.

This is what the composer seems to be saying as the lengthy quotation ends with a sharp change and the thematic development begins—that there is enormous revolutionary power inherent in this requiem, a great and tragic cry for an end to the old order and the beginning of a new. The song penetrates the czar's palace; the fugue drives before it the czar's ministers, his servants, his generals; the cries from the palace square rise again and again to drown out the fear and the foreboding of the first movement.

The fourth movement, a tocsin, evolves organically from the third. It fuses with great musical power the historic voices of this century and the revolutionary songs of the people.

Who knows how many songs, born of anonymous folk art, would have been forgotten and lost had they not been embodied in the great and immortal symphonies. And these that Shostakovich uses in his Eleventh Symphony—born out of war, revolution, exile, prison—who except people of my generation remembers these songs that young workers and students a half century ago loved and sang. Another half century and they would have been buried in oblivion, lost forever, if not for this symphony, which gives us a musical bridge from the past into the future.

The City Listens

It was a strangely quiet Leningrad audience which listened to the première. It was music out of their lifetimes; for the young people, out of their parents' lifetimes. One felt that the city itself, the physical city of brick and stone and pavement, the city which Peter the Great built on swampland, was listening and remembering not 1905 alone, but 1917—listening to the voice of Lenin from the top of an armored car, the salvos from the battleship *Aurora* that carried the sound of revolution from this city throughout Russia.

And then, with the symphony ended, there was a moment longer of silence, as though involuntary, and then a crash of applause and an ovation that Leningrad had rarely seen, as the city and the audience paid tribute to the composer.

The performance given by the Leningrad Orchestra under the baton of Yevgeni Mravinsky was superb—equal to the challenge presented by the new symphony. The four movements of the symphony were played without the usual intervals. The conductor made the musical transition from one movement to the next with consummate artistry and command. The orchestra played with precision, grace, and that added animation that comes with pleasure in its own performance—a performance as rare and as unforgettable as the symphony itself. ■

(Abridged from the newspaper *Izvestia*)

The composer and Nathan Rahlin of the Moscow Conservatory acknowledge warm applause of the audience after a first performance in capital.

MONEY IN THE BANK

By ARSENI ZVEREV,
Finance Minister of the USSR

"The rising living standard is reflected in the Soviet citizen's growing bank account," **says the Finance Minister of the USSR.**

DEPOSITS in savings banks are a fairly reliable index of living standards. This is true for a country as well as for a single family. Soviet savings banks have 40 million depositors—one out of every five persons. Another way of saying that practically every Soviet family has money in the bank.

Larger savings mean a rising living standard. Total deposits in Soviet savings banks have been increasing year by year from 7.3 billion rubles in 1941 to 18.5 billion in 1951 and to 53.7 billion in 1956. Now they are 73 billion rubles.

The average deposit has also increased four times over as compared with the prewar figure. The average rural depositor now has 1,200 rubles and the city depositor 2,000 rubles in his savings account.

More savings banks have been opened to accommodate depositors. Of the 52,000 banks serving rural and urban communities, 3,300 were opened during 1957. Now 70 per cent of all banks are in the city areas, the remaining 30 per cent serve country communities.

Families use their savings to buy furniture, cars, TV sets, more expensive clothing—generally speaking, items which are not considered necessities.

There is no need for people to save in order to carry over during periods of unemployment, since there has been no unemployment in the Soviet Union for more than a quarter of a century. Nor is there any need to put money away against illness, since all medical services are free. There no longer is any necessity to save for old age, since security is assured by universal old-age pensions. College education for the children of the family, which must be saved from earnings in other countries, is free in the Soviet Union.

How It Works

All savings banks in the Soviet Union, whether rural banks run by the local post office or big city banks with dozens of clerks and tellers and thousands of depositors, are part of the same national bank system. Depositors in every bank are issued the same kind of bankbook and make deposits and withdrawals in the same way.

Government guarantees cover savings bank deposits. Depositors may bequeath their savings to heirs and may grant power of attorney to others for deposits and withdrawals if they so choose. Information as to individual deposits is not revealed by a bank except at the specific request of the depositor.

There is no limitation on amount of deposit or length of time it is kept in a bank. The minimum is five rubles.

Reliable and Convenient

Two-thirds of savings accounts are call accounts. They can be withdrawn either in part or in full on demand. This type of account pays two per cent interest annually to the depositor.

The remaining third are time deposits. These are made in a lump sum and may be withdrawn only in full at the end of six months, at which time they draw interest at three per cent. The depositor may withdraw his money sooner, but if he does, he is paid only two per cent, as with call deposits.

There are also winning deposits, which make up a small part of total savings accounts. They differ from ordinary call deposits only in that interest is paid not in specified annual percentages but in winnings out of a pool. The total interest for all such deposits, figured at two per cent, is pooled, and then a drawing is held. Those depositors whose numbers are drawn win sums ranging from 25 to 200 per cent of the average sum they kept on deposit during the six preceding months.

Personal check accounts may also be opened at savings banks. These pay two per cent interest. Trust funds also pay two per cent. These are accounts opened by parents for children, for example, to be drawn on after they graduate.

Savings banks also issue traveler's checks, which may be cashed at any savings bank in the country. People who go on vacation or travel use them widely. The amount sold totals some 10 billion rubles annually.

There are no private banks in the Soviet Union. All banks are owned and operated nationally. Deposits are borrowed by the government for temporary use to build the economy and to extend social services. These are values which accrue to every citizen and are reflected in such recent benefits as the increase in pension payments, reduction in working hours without reduction in pay, lengthened maternity leaves, rise in the guaranteed minimum wage, lower taxes and reduced prices for certain consumer goods.

The mutual relation between the constantly expanding economy and the constantly rising living standard is reflected, too, in the Soviet citizen's growing bank account. ■

A section of the busy deposits division of the central savings bank in Shcherbakov. Most people prefer cash buying and accumulate money for major purchases in savings accounts.

On buildings in cities you can see signs like this saying: "Keep money in a savings bank, it's reliable and convenient."

Several employees count the currency and government savings bonds in the cashier's department of the Shcherbakov bank.

When Kazimir Bobrovsky, a retired army man, surprised his youngest daughter Sonya with a piano, the musically-inclined 13-year-old lost very little time in trying it out for tone.

IT'S NOT F
RAINY D

What Depositors D Wi

BY GEORGI YURYEV

ONE out of every three people in the town has a savings account, says Lydia Poyarkova. She is head of the Central Savings Bank of Shcherbakov, a town on the upper reaches of the Volga River.

Shcherbakov has a population of 160,000—river diesel boat pilots and dock workers, factory workers, teachers, engineers, doctors, and the variety of occupations characteristic of a river town. It is a fairly typical town in most respects, growing fast, with more work to be done than workers to do it.

The new plants, a hydroelectric station and a large printing establishment are all products of the last few years of steady building. "All this building," says Lydia Poyarkova, "shows up in our deposits. So do rising wages, lower prices, and higher pension payments. It has all meant larger deposits and more depositors. In the past five years the number of savings accounts in our town has grown by 20,000. We have 55,000 depositors now, with close to 100 million rubles on deposit."

The Shcherbakov central bank has 25 branches that service about 1,200 people daily.

Continued on page 18

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Y DAY

Do With Their Savings

Serafim Tukhtin, a chauffeur, cashes in bonds which he had been saving to buy his own car. These bonds pay three per cent interest annually and can be bought and sold at any time.

Farmer Sergei Sergeyev and his sons put a fence around the house built with the help of savings.

A few days later Tukhtin and his son were driving around town in a new "Moskvich." The family will now decide what their next big purchase is to be and start saving for it.

FINANCIAL HUDDLE: THE "COUNCIL" OF VENYAMIN DEGTYARYOV'S FAMILY IS DECIDING WHETHER TO BUY A TV SET OR FURNITURE FOR THEIR SON'S HOUSEWARMING.

IT'S NOT FOR A RAINY DAY

Continued

Alexandra Golubyeva, pensioned teacher, is a veteran depositor at the bank in Shcherbakov.

Twenty branches take care of the rural area around the town. They are located in the larger villages, on state farms and in local post office buildings. About 10,000 people are depositors at these country branches, and the deposits total more than 16 million rubles.

Who are these depositors and what are they saving their money for? The bank's clerks and tellers do not answer questions about depositors, even to writers of magazine articles, but Lydia Poyarkova introduces us to people who come to make deposits or withdrawals.

Depositors Tell Their Stories

Robert Gusikhin is a young man, just out of the electro-mechanical secondary school in the city of Gorky. He is now working at the Shcherbakov Scientific Research Institute for Polygraphic Machine-Building. He was recently married to Tamara, a cutter in a dress factory.

The joint income of these newlyweds is modest, as yet. They are both on their first jobs and hope to move ahead quickly. But even on their 1,300 rubles a month, they decided they were able to put aside 300 to 400 rubles every month. Robert was opening an account and making his first deposit.

Serafim Tukhtin is a chauffeur who opened his savings account in 1953. He had something very specific in mind—he wanted to buy a car. Tukhtin saved his money, not in a regular savings account, but by purchase of government bonds. These pay 3 per cent interest and can be cashed at any time and at any savings bank.

Tukhtin had just cashed 12,000 rubles' worth of bonds. He slapped his pocket and laughed, "Well, my 'Moskvich' car is in my pocket. I sold my motorcycle for 3,000 and the rest is right here."

Plumber Venyamin Degtyaryov and his wife have been putting aside from 300 to 500 rubles from their monthly income of 2,000 for a special housewarming surprise for their son, Valeri. The Degtyaryovs are a close-knit family and when Valeri married five years ago, the family decided to help build a house for the couple.

Valeri was given a plot of land and a home-builder's loan of 7,000 rubles at 3 per cent for

seven years by the machine-building factory where he works. Three thousand rubles additional came from family savings. The senior Degtyaryovs are now putting money away for furniture and a TV set for the new house. They have 3,000 rubles on deposit already, and soon they'll be shopping.

Sergei Sergeyev, a farmer at the Tvorchestvo Collective Farm, is another depositor who built a house with his bank savings. When his eldest son, Nikolai, got married, Sergei bought him a house as a wedding gift. Then he decided that he wanted to build a new house for himself near his son's.

Sergeyev and his younger boy, Anatoli, do field work on the collective farm. His wife, Anastasiya, looks after the horses. The three earned 7,000 rubles for their summer's work at the farm. They received additional income from the sale of milk from their own cow and surplus vegetables from their own garden. Every collective farmer has his own garden plot and animals.

Sergeyev made a regular monthly deposit, and little by little enough accumulated to start building. This past summer the framework of the new house went up alongside his son's with appropriate family celebration.

There is Kazimir Bobrovsky, retired army man who saw 30 years of service. He retired on a pension of 2,500 rubles a month. He has three children. The youngest, Sonya, is 13 and is musically inclined. Bobrovsky just bought her a piano, and now he is saving for the next big family purchase which hasn't been agreed on yet.

Or Margarita Runich, an actress at the local theater, and Vladimir Smirnov, her husband, an actor and director, both people in their early fifties. They came to the bank to withdraw 7,000 rubles from their savings account. To be used for what?

Cash on the Line

Margarita Runich explained. "We don't have to save for that rainy day that people used to talk about when we were young. Not with pensions. And unfortunately we don't have children to save money for. We both like to travel, and that's what we save for. We're going to make a trip south, to the Black Sea coast."

Reasons for saving are as varied as the individuals who save, whether in Shcherbakov or in any village or city you might name. People in the Soviet Union do not go in for installment buying. They like to pay cash on the line, whether for a house or a washing machine or a car or a trip, with money put away in savings. ■

High school student Nina Belyakova looks pleased as she examines the first entry in her bankbook.

EACH DISTRICT IN SHCHERBAKOV HAS ITS SAVINGS BANK. THERE IS ALSO ONE ON MIR (PEACE) STREET, WHERE SEVERAL NEW APARTMENT HOUSES RECENTLY WENT UP.

LISTENING TO T

BY IVAN SAVCHENKOV

Master of Science in Medicine

Ivan Savchenkov and his assistant at the Therapy Institute of the USSR Academy of Medical Sciences.

IT WAS a century and a half ago that René Laënnec, the French physician, invented the stethoscope. First used to study tuberculosis, it has remained an indispensable tool of the physician for auscultation of the heart. But in these hundred and fifty years, with the enormous widening of medical horizons and techniques, there have been no marked changes in the design of the familiar instrument or the method of its use.

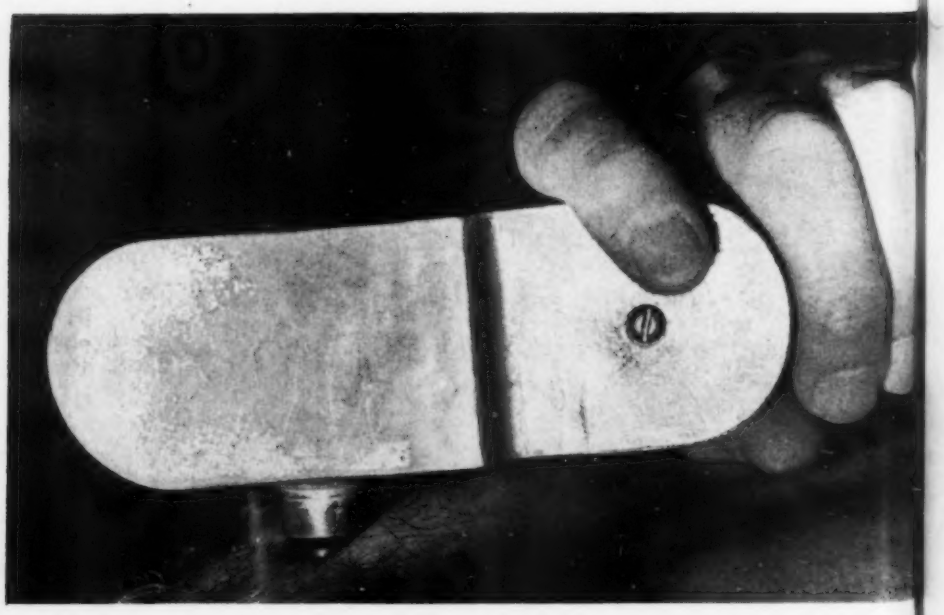
The stethoscope, as useful as it is, cannot be relied on for diagnosis by itself. One physician will hear one sound, another will hear quite a different one. There are cases in which even eminent heart specialists came to different diagnoses after auscultating one and the same patient.

There is the difficulty, too, of confirming diagnoses with other instruments. A physician may hear through his stethoscope the sounds characteristic of a certain heart defect; the roentgenologist, however, will find in his X-ray of the patient no changes in the configuration of the heart to confirm the diagnosis. Or the reverse may be true, the roentgenologist may find changes characteristic of a particular heart defect and the physician upon auscultation will detect no pathological sounds to confirm it.

Logic obviously leads to some diagnostic procedure which uses a combination of methods. This approach was the one adopted in a laboratory specifically designed for this type of research by the Therapy Institute of the USSR Academy of Medical Sciences.

The laboratory has in effect worked out the modern electronic equivalent of the Laënnec stethoscope. It has set up receiver-transmitter units which pick up and amplify the cardiac sounds. Not only the examining

Modern electronic equivalent of the Laennec stethoscope. It has a receiver-transmitter unit which enables anyone in the room to listen to the patient's heartbeat.



THE HEART

physician but anyone in the room, the patient included, can listen to the heartbeat.

The instruments used for auscultation are synchronized with an X-ray unit, so that the physician can at one and the same time listen to the sounds of the heart and observe it in action. The rate of heartbeat, the degree of activity of cardiac muscles and other helpful indices are registered on cine-film for study.

A miniature sound microphone was also constructed for this laboratory. It is simply and painlessly introduced into the esophagus, the trachea or even the stomach to transmit cardiac sounds.

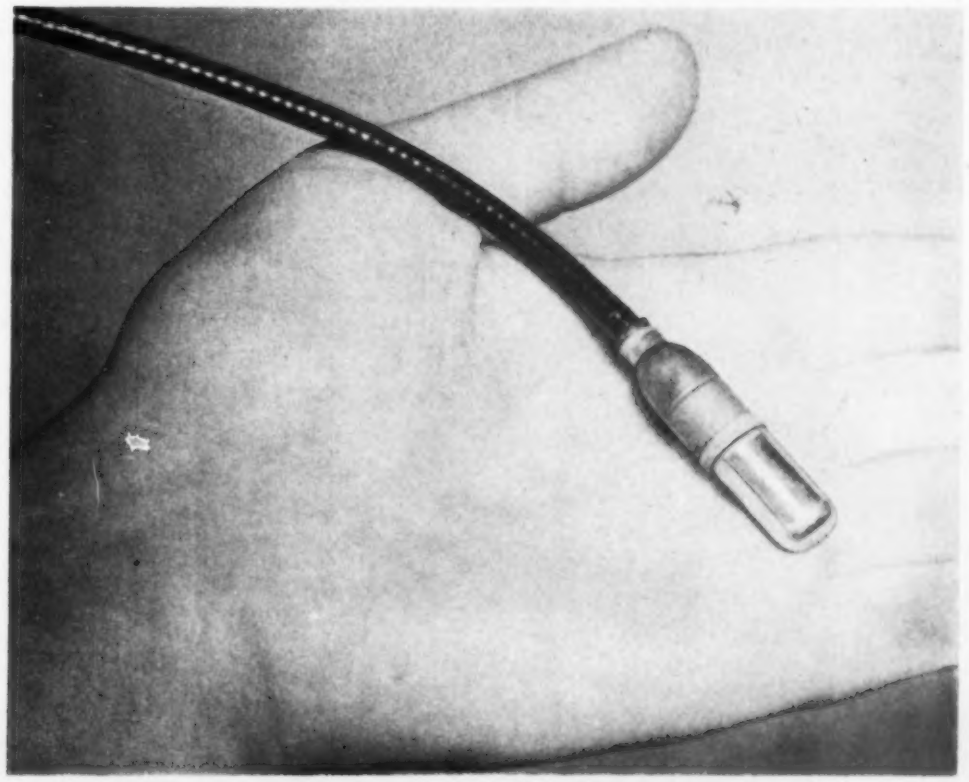
Clinical and surgical practice has demonstrated that this simultaneous method of investigation is of great value in diagnosis of congenital defects of heart and blood vessels, particularly in determining the length, level and the degree of constriction of the lumen, or passageways of blood vessels.

Sound roentgenology can reveal the early stages of afflictions of cardiac muscles and blood vessels at a period when the anatomical signs are not pronounced enough to be seen on the ordinary screen.

The method has also proved its value in consultations and in teaching at the medical institutes. All consultants listening to an auscultation hear the same sound with the same depth and intensity. Details which escape the stethoscope are amplified. The procedure opens valuable new approaches in heart surgery too, besides permitting more precise diagnoses and more accurate treatment. It is likely to prove of particular value in detecting incipient heart ailments early enough to prevent them, a vitally important factor in view of the very high mortality of diseases of the heart. ■

New method of auscultation picks up and amplifies cardiac sounds while the heart is simultaneously flashed on the viewing screen.

This microphone probe makes sounds of the heart audible directly from the alimentary canal. Instrument assists in the detection of various incipient heart ailments before anatomical symptoms are pronounced.



BACK TO CIVILIAN LIFE

Photos by Dmitri Chernov

GENNADI VLASOV entered the army in 1955 from the village of Borki on the Volga River. Now his service is about to conclude and he is ready to return to civilian life far better prepared to serve his country, his fellow men and himself.

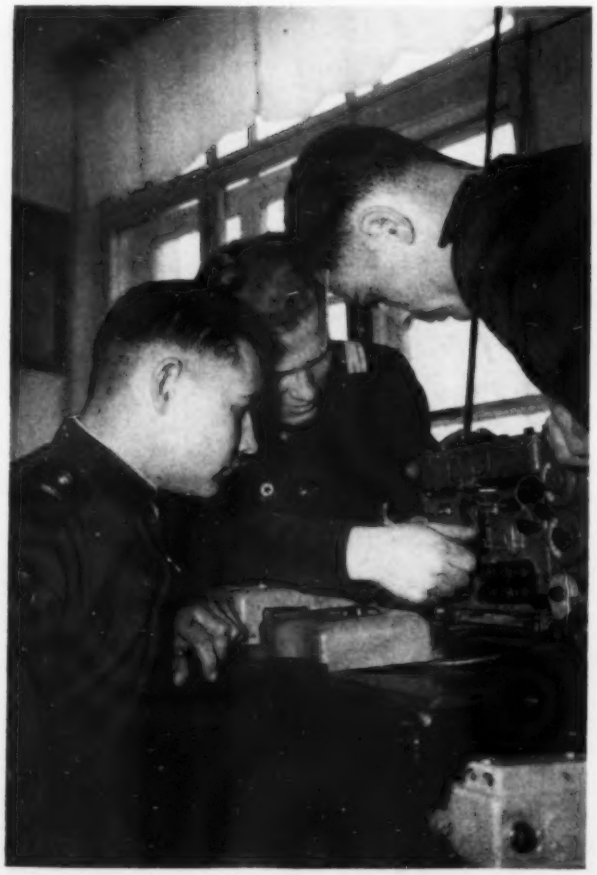
Upon enlistment Vlasov elected a tank unit because he felt it would be most helpful in realizing his dream of becoming a tractor driver. In addition to his military training, he was taught many things that will prove useful, including the maintenance and repair of motors. He was also able to develop his cultural interests, hobbies and sports prowess.

UP FROM THE RANKS TO BECOME A SENIOR SERGEANT, YOUNG VLASOV WAS SOON TEACHING MANY RECRUITS THE FACTS ABOUT MOTOR CARE AND OPERATION.

GENNADI AND HIS FRIENDS LOOK FORWARD TO LEAVE PERIODS. HERE THEY PREPARE FOR A SHORT HOLIDAY WITH RELATIVES. GENNADI SOON COMPLETES HIS SERVICE.

More pictures on following pages

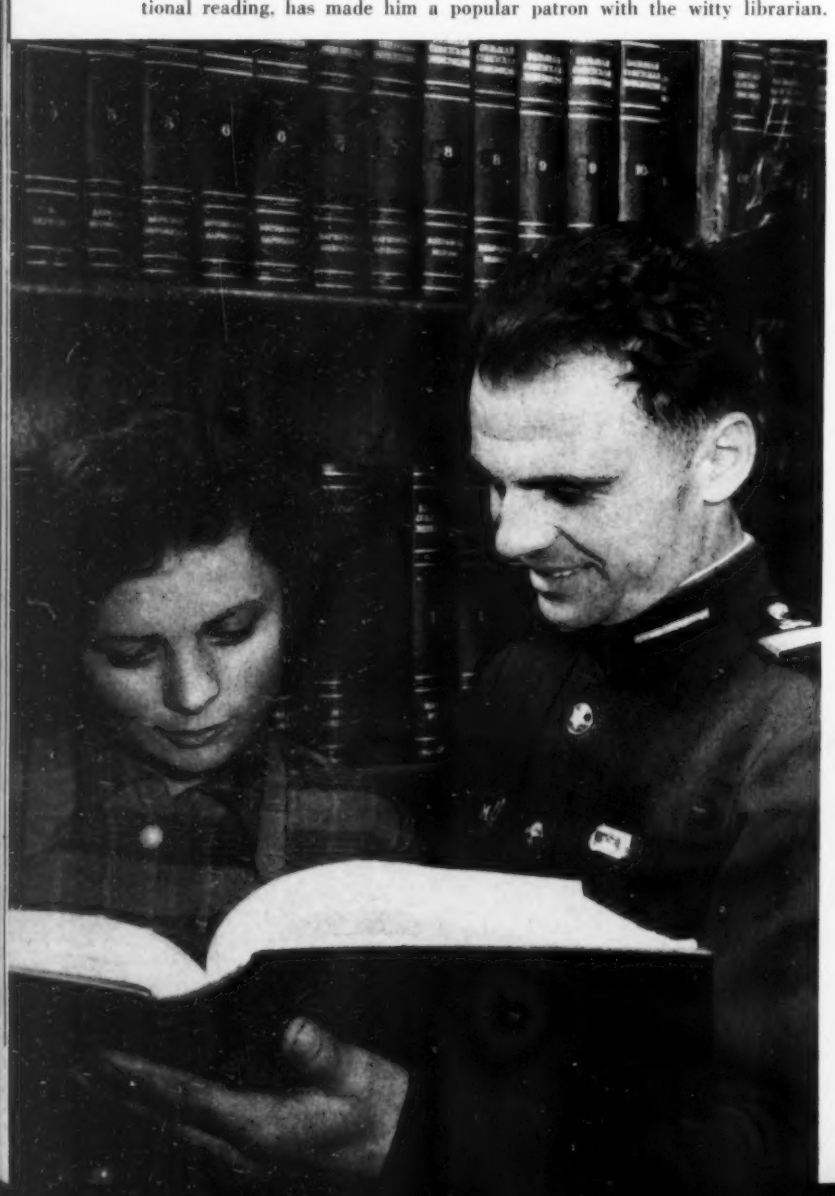
In addition to becoming a professional driver, Gennadi acquired the useful sideline of radio mechanic and operator.



The regimental library's reading room offers a variety of literature, fiction and current magazines to meet a wide range of interests.

AFTER HOURS THE SERVICEMEN'S CLUB IS THE CENTER OF A VARIETY OF ACTIVITIES. THE ARMY ENCOURAGES THE INTELLECTUAL DEVELOPMENT OF ITS SOLDIERS.

Vlasov's interest in machinery and agriculture, along with his recreational reading, has made him a popular patron with the witty librarian.



Back to Civilian Life *Continued*

Proof that Gennadi and his friends are in good form is shown by their cups and trophies. Regimental teams play almost all sports.

KEEPING IN TOUCH WITH HOME FRIENDS, VLASOV RECEIVES A LETTER OFFERING A GOOD JOB AS TRACTOR TEAM LEADER AT ENLISTMENT END.

SENIOR SERGEANT VLASOV TALKS WITH FARM FRIENDS AND ANNOUNCES HIS ACCEPTANCE OF THE JOB THAT ARMY TRAINING MADE POSSIBLE.

State Hermitage Museum

By Yuri Sergeyev

Each year a million and a half people walk up the Jordan Staircase of the Winter Palace. At present it is the main entrance to the Hermitage.

ACCORDING to dictionary definition "hermitage" means "the habitation of a hermit" or "a secluded residence." This would have sufficed to describe the rooms in the Winter Palace which Catherine II set aside for her private recreation and entertainment. But today, to art lovers the world over, Hermitage means a place on the Neva River in Leningrad where thousands of people may, and do, gather to view and study the greatest art treasures of all times.

The metamorphosis of the word is interesting.

The history of the Hermitage collections starts with 1764, when Catherine bought many great works from Gozkowski, a Prussian merchant, and the Russian ambassadors to foreign courts were ordered to find and purchase paintings and sculptures "worthy" of the imperial Hermitage.

Several rooms of the Winter Palace were set aside for the Gozkowski collection, and that year construction was started on a pavilion next to the palace that was later called the Little Hermitage. It was large enough to hold the first collections, but as time passed two additional buildings were needed. They are connected with the first by passageways and are now known as the Old Hermitage and the New Hermitage.

The museum soon became filled with priceless canvases, drawings, etchings and prints; sculptures; mirrors, vases, crystal and porcelain; silver, gold and precious stones; books, coins and snuffboxes.

The French philosopher Denis Diderot, whom the Empress had rescued from financial straits, acted as Catherine's agent in purchasing 300 masterpieces from the famous collection of the Baron de Thiers. Among them were works by Rembrandt, Raphael, Giorgione, Titian, Rubens, Van Dyck and Poussin.

The Hermitage collection continued to grow under succeeding rulers. In 1914 the museum records showed 630,000 items. But although the Hermitage was nominally open to the general public, it was actually in reach of only a select few. Five hundred visitors a day was considered a record event.

From the very first days of the October Socialist Revolution of 1917, Red Guards took up posts in front of the Hermitage, for this Palace of

Art, like all the riches of the country, became the property of the people.

In November 1917 a board was set up under the People's Commissariat of Education to handle matters connected with the country's museums and the preservation of art treasures. The next year a special decree forbade "the export of objects of particular artistic or historical significance, representing a loss to the cultural treasures of the people." In order "to acquaint broad sections of the population as fully as possible with treasures of art and antiquity," the government issued another decree on the sovereign right of the people to the nationalized treasures.

From time to time trucks guarded by Red Army men would drive up to the Hermitage and unload works of art left behind when their owners fled abroad. Innumerable purchases and gifts increased the collection. The museum soon could not hold all its treasures, and the Soviet Government placed the entire Winter Palace at its disposal.

Exhibits Reorganized

For 150 years the Hermitage had been a lifeless collection of art objects of different periods and styles. True, it had been divided into sections, but not with any particular principle in mind. Although the picture gallery was grouped according to countries, the order of the rooms was haphazard. Size was often the only factor considered in determining the location of a canvas.

The Eastern section was the first to be reorganized after the Revolution. It was laid out by scholars who viewed the function of a museum in a new light and had a new conception of research within its walls. They sought for similarities in the cultures of different peoples and found them in societies which had attained the same level of historical development. They studied every item, every art object, and established the connection between monuments of different ages and peoples.

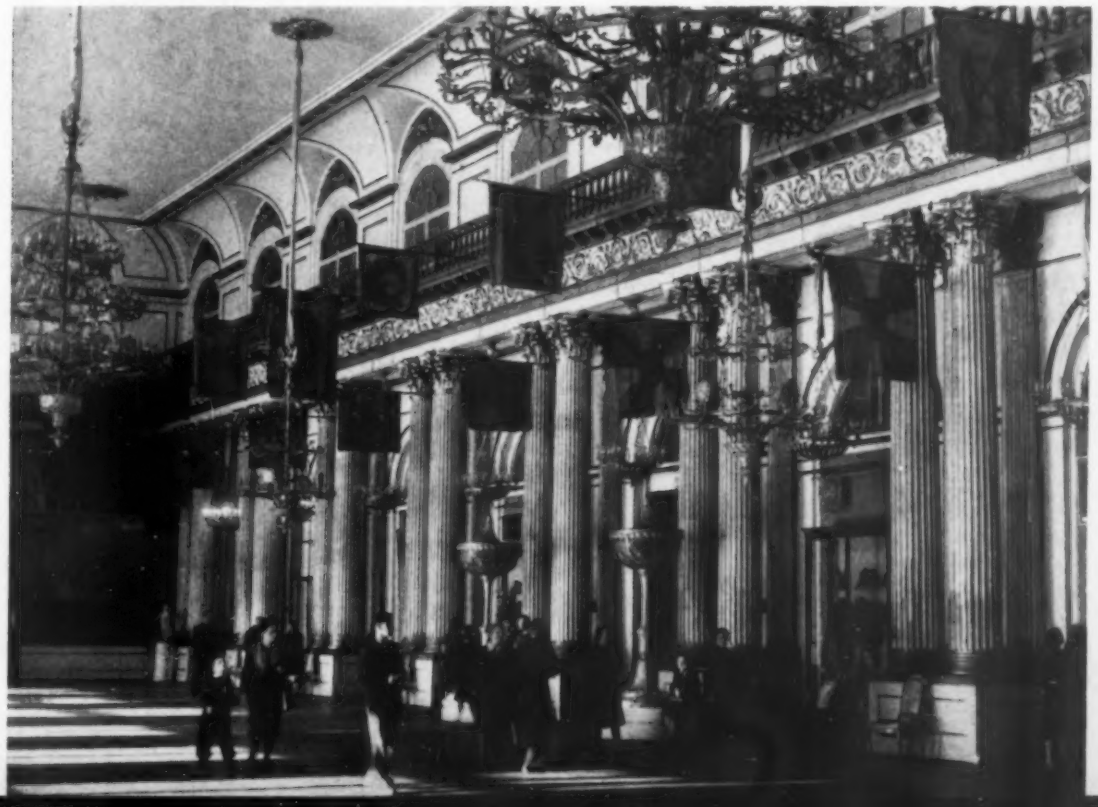
The new displays at the Museum are a truly scientific achievement. They present a vast and varied amount of material in a historical light, help the visitor to acquire a true appreciation of art monuments of the past and bring out the objective significance of the work and the artist, the ideas embodied in the work and the depth and mastery with which the artist reflected the life of his times.

Seven of the eight main sections of the Museum have their own exhibition rooms. They include 26 rooms on the History of Russian Culture, 22 rooms on the History of Primitive Culture, 22 rooms on the History of the Culture and Art of the Peoples of the Soviet East, 37 rooms on the History of the Culture and Art of Foreign Countries of the East, 19 rooms on the History of Ancient Culture and Art, 122 rooms on the History of West European Art, and a section on numismatics.

Continued on next page

French fine and applied art from the fifteenth to the nineteenth centuries is displayed in 39 of the 122 rooms that are devoted to West European art.

One of the many spacious halls in the State Hermitage at Leningrad. The guided tours through the museum may take anywhere from three hours for the viewer who makes just a general survey, up to 30 visits for a thorough study.



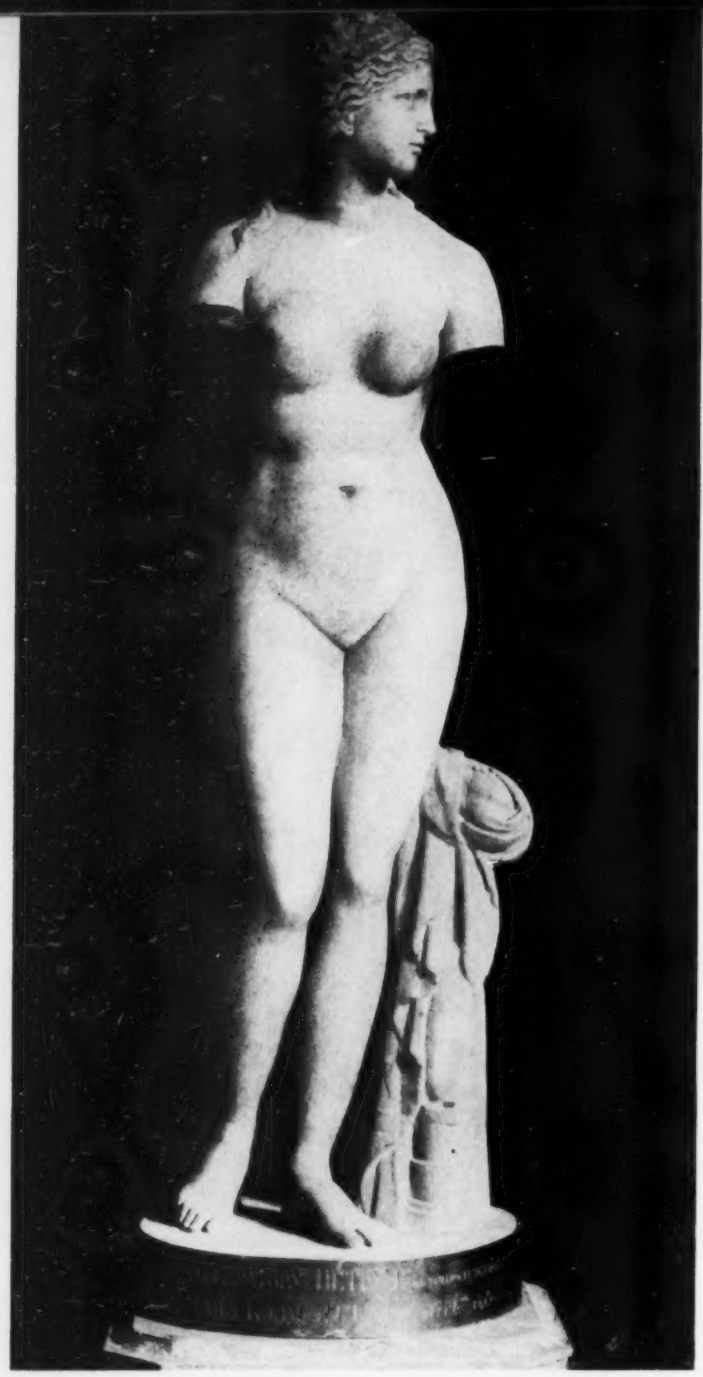


Exhibit on Roman sculpture contains this marble statue known as the Venus of Taurida. Acquired by Peter I, it dates back to 300 B.C.

State Hermitage Museum

Continued

The collections are still growing with the help of contributions, purchases being made in the Soviet Union and abroad, and through the findings of archaeological expeditions. Since 1917 more than 1,700,000 rare monuments of art and culture have been added to the brilliant collections in the Hermitage Museum.

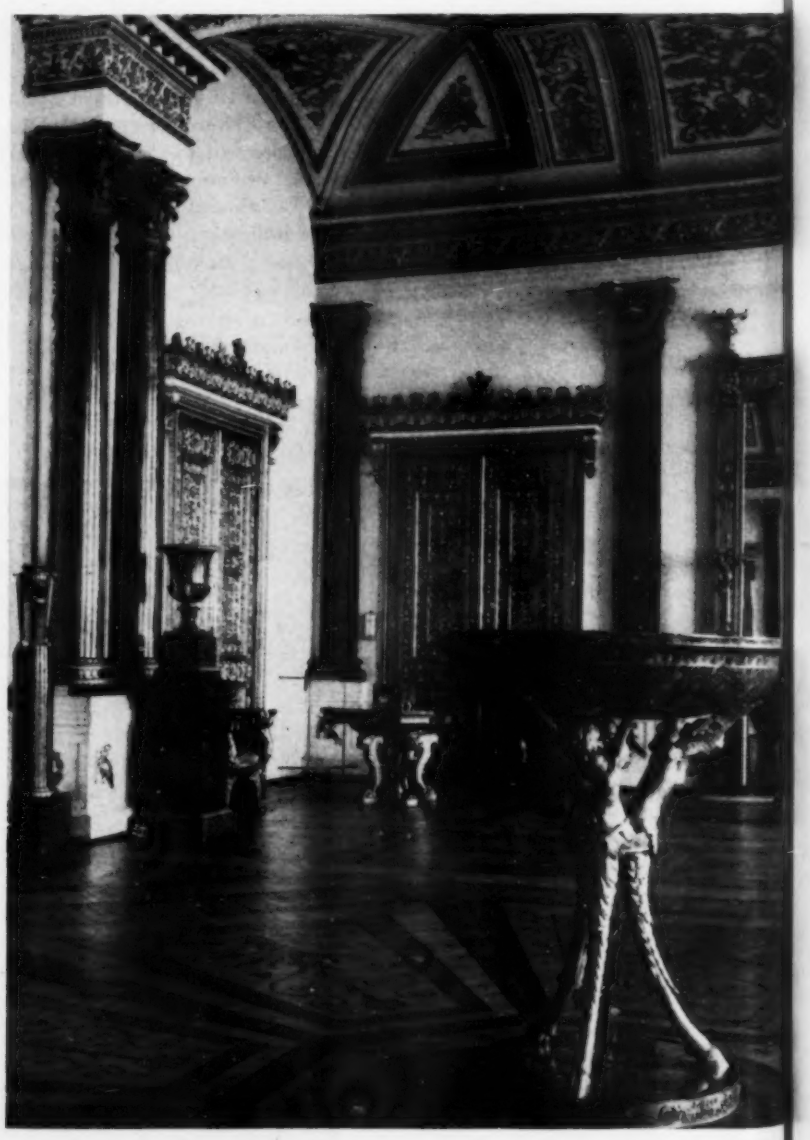
When representatives of factories, mills, collective farms, offices, universities and schools request guides at the museum's excursion bureau, they are always asked how much time they want to spend on the tour. A general survey is possible in three hours, but to make a systematic study of the various sections takes anywhere from six to thirty visits. To see all the exhibition rooms in the museum, which has 330 galleries and halls, a visitor must walk 15 miles.

A million and a half people pass through the Hermitage each year. Two hundred forty groups are studying the basic stages in the development of culture and art, the work of the greatest artists of the past.

This is the way in which Soviet life has changed the meaning of the word "hermitage." This is how an exclusive archive museum grew into a popular national academy of art. ■

A collection of various objects of art dating from 20 B.C. to the present era makes up this seventeen-room exhibit on the Culture and Art of China.

The columns, pilasters and fireplaces in this hall are all faced in bright green malachite, as are objects made by Russian masters on display here.



Leonardo da Vinci painted the *Madonna Litta* in 1480. It hangs with his *Madonna Benois* in the section on Italian art from the thirteenth to the eighteenth centuries.

Continued on next page

Perseus and Andromeda is one of Rubens' finest mythological paintings. Two rooms devoted to seventeenth century Flemish art include 18 canvases by Rubens.

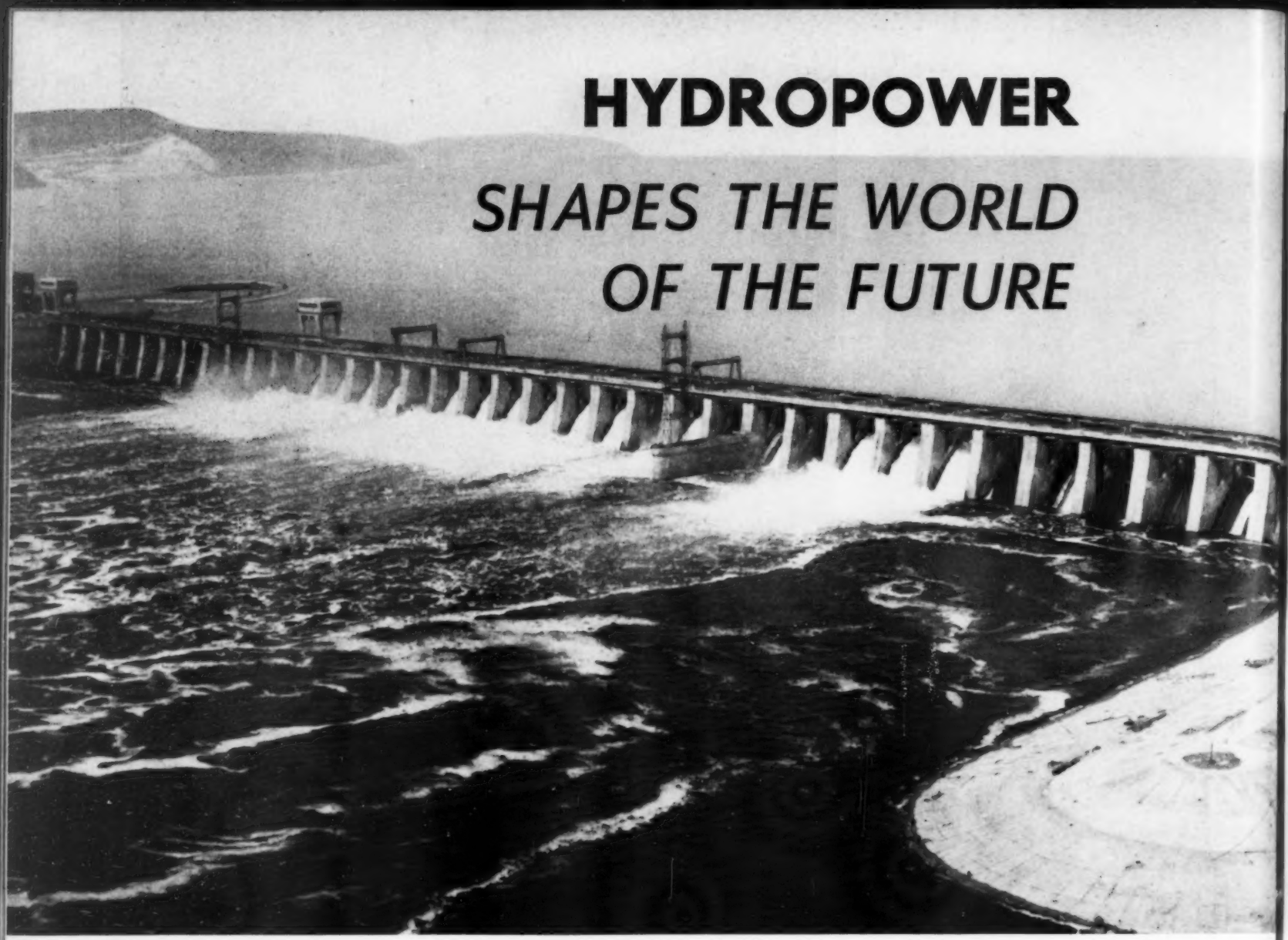
State Hermitage Museum *Continued*

The Repentant Magdalene was painted by Titian in the early 1560's. *St. Sebastian* and *A Young Woman* are among the other works of the Venetian master displayed in the Hermitage.

Rembrandt painted his *Danae* at the height of his talent. The museum has a collection representing the Rembrandt school in addition to a number of other canvases by the master himself.

Portraiture occupies the main place in eighteenth century English art. *The Duchess de Beaufort* was painted by Gainsborough, one of England's outstanding artists.

The Hermitage's collection of French impressionists is a famous one and includes canvases by its greatest exponents. This is *Girl with a Fan,* painted in 1881 by Renoir.



HYDROPOWER
SHAPES THE WORLD OF THE FUTURE

By Alexander Markin
Hydraulic Engineer

LOOK at a map of the Soviet Union. Its great land surfaces, one-sixth of the world's total, are crisscrossed by more than 100,000 rivers. Their length added would stretch for 1¼ million miles, five times the distance from the earth to the moon. The basins of three of the rivers—the Yenisei, the Ob and the Lena—are as large as the territory of the United States.

The Soviet Union has nearly 15 per cent of the world's total water-power resources, enough to generate annually 3,700 billion kilowatt-hours, twice as much as all the electric power stations in the world generated in 1957. How is this wealth of potential power to be used economically and rationally for man's benefit?

Much more is involved in this question than the production of cheap electric power, even on this gigantic scale. The answer must see far into the future. It must consider food, minerals, forest resources, soil fertility.

Long-Range Planning

Soviet hydropower planners are thinking in these larger terms. They are able to because the Soviet economy permits—more than that, it demands—this long-range comprehensive approach. Exploration covers not only single rivers and basins, but all the water-power resources as they will affect the total economy of the country. And this not only for the next 10 or 20 years, but for the next 40 or 50 years, to the year 2000 and beyond.

Does this seem like speculating on an unforeseeable future? Consider the problem of food alone. The population of the Soviet Union is growing. By the year 2000, according to estimates, it should have increased from the present 200 million to 500 million. How are the 500 million people to be fed? How is a surplus of food to be raised for export trade?

More must be done than to increase present soil fertility; land areas now unused must be placed in cultivation. One of these potential areas is the West Siberian lowland; another is the Caspian hollow and the Central Asian deserts. Ten times larger than the territory of Britain, they could become important granaries for the nation.

Large-scale irrigation and land reclamation work will have to be done, but in time the West Siberian lowland will yield as much farm produce as all of the United States does now. Central Asia, already important as a cotton-growing and sheep-raising region, will produce even more when water is brought to its deserts. The Caspian hollow will also become a flourishing farm area.

There have been proposals advanced by hydropower engineers who place emphasis on more electricity. Their plans to build power stations in the middle and lower reaches of the Ob, with dams and reservoirs, propose to flood portions of the West Siberian lowland. Such planning, in my opinion, would make huge areas unavailable for food growing and would be prodigal waste of the immense forest and mineral wealth of Western Siberia.

It seems to me that this is thinking with only the next decade in mind, or perhaps the next two decades. It is on a larger and grander scale that hydropower planning must be done.

An Inexhaustible Source

Water power is an inexhaustible, constantly replenished source of energy. To produce the same quantity of electricity a hydroelectric station needs only a fraction of the labor required by a thermal plant.

Thanks to available sources of cheap hydroelectric power, industries to produce ferro-alloys, aluminum, magnesium, nitrates, synthetic rubber—all of them large electricity-

consuming industries—have grown. Then, too, along with hydropower development new industrial centers arise in hitherto undeveloped regions. So that the power industry must expand at a faster rate than other industries.

The Soviet Union plans in the next few years to increase the output of electricity by 150 billion kilowatt-hours. This figure is equivalent to the total power output of Britain and France for 1956.

Almost 400 large hydraulic and thermal stations are now under construction. All this requires a volume of earth and concrete work that would be sufficient to dig eight Panama Canals. Work is also under way on the design and building of large atomic power stations.

A new Volga-Baltic waterway is being built with large hydroelectric stations, locks, piers and other installations. This 220-mile water artery—to supplement the White Sea-Baltic Canal which was opened for service in 1933—will provide access to ships traveling from the southern seas, via the Volga, to the Arctic Ocean and the Baltic Sea. By 1960 freighters will be carrying oil, wheat, and farm machinery northward, and Vologda and Karelian timber and paper and Leningrad-manufactured goods southward.

Hydro-engineering projects to irrigate arid and desert lands have been undertaken on a vast scale during these past years. Both irrigation and waterway projects have been combined with the building of new hydroelectric stations.

Chains of power plants make use in sequence of the water level drop along the whole course of a river. The Volga cascade, with its two mammoth plants, the Kuibyshev and the Stalingrad, are the most imposing of these projects for the complete utilization of a great river. Its significance may be measured by the fact that within the Volga's basin are 350 cities and towns, one-third of the country's population, contributing almost half of its output of manufactured and farm products.

DISTRIBUTION OF HYDROPOWER RESOURCES OF THE USSR AMONG AREAS

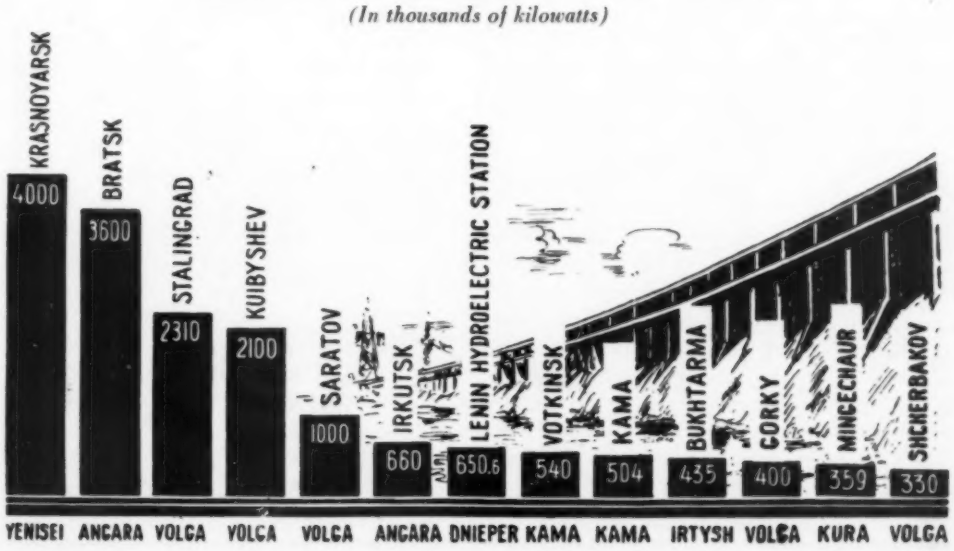
(In percentages of the total)

Fully harnessed, the Volga and its tributaries will generate up to 60 billion kilowatt-hours of electricity annually. Within the next 10 to 15 years the water-power resources of the river will be fully utilized. The Volga will at the same time become a deep waterway throughout its entire length and will provide water for irrigating the arid area in the river's lower reaches.

Throughout the country additional hydroelectric stations are in process of construction.

BIGGEST HYDROELECTRIC STATIONS IN OPERATION AND UNDER CONSTRUCTION IN THE USSR

(In thousands of kilowatts)



Siberia

The future of the Soviet economy lies in the development of Siberia, an immense region with fabulous resources. In Siberia are 80 per cent of the country's water-power resources, 75 per cent of its coal, four-fifths of its timber, its main reserve of non-ferrous and rare metals, large deposits of iron ores and raw chemicals. Here also are great deposits of gold, platinum, diamonds and other precious minerals. Here are the famed Russian furs.

Within the past 30 or 40 years a stupendous transformation has taken place in Siberia. Various industries have been established and are growing, new cities have sprung up, and, more recently, Siberia has become a major grain-growing center of the country. Siberia's future will largely depend on the development of its eastern part.

Eastern Siberia is a great sunny land, where the sky is almost always blue and the air fresh and dry. It has twice as many sunny days a year as Moscow and almost as many as the Crimea, the world-renowned resort region. This is a favorable climate for the development of agriculture.

Planners say Eastern Siberia will in the next ten years become a major producer of coal and electric power. Heavily industrialized, it will supply the country with huge quantities of metals, chemical products, machines, lumber. Its farms will provide great wheat crops, butter and meat.

This perspective presumes a comprehensive hydropower program, part of it already fulfilled, much more in prospect. By 1960 Eastern Siberia will be generating 130 billion kil-

Continued on next page

HYDROPOWER
SHAPES THE WORLD OF THE FUTURE

Continued

owatt-hours of electricity, almost as much as the entire output of the Soviet Union in 1953 and equal to the combined output of Britain, Norway and Sweden in 1955.

The prospects for hydropower development are incalculably great. These are titanic projects being planned to harness the Siberian rivers.

On the Irtysh, the Ob and the Yenisei rivers some stations are already in operation or being completed; others are under construction or in the blueprint stage.

Then there is Lake Baikal and the mighty Angara River, unsurpassed anywhere in the world for its hydropower potential. The Baikal fills up a huge granite bowl with more water than is contained in the Baltic Sea. Some 336 streams flow into the Baikal but only one flows out. This is the Angara which cuts across East Siberia, flows for 1,150 miles and then empties into the Yenisei, forming with it a great stream of water that finally runs into the Arctic Ocean.

A master plan for the Angara provides for the construction of a cascade of six stations with an output of 70 billion kilowatt-hours annually. Together with stations on the river's tributaries, it will produce more electricity than France, Sweden and Belgium combined.

The great hydropower stations on the Angara and the Yenisei and large automatic thermal plants fed by the region's abundant coal supplies will be the focus of the unified power system of Central Siberia. Immense changes will be effected in these expanses.

The Angara-Yenisei area has resources of raw materials for heavy industry on a colossal scale, for production of iron, steel, aluminum, magnesium, nickel, calcium carbide, synthetic rubber, chlorine, machinery and a wide assortment of consumer goods. Two or three Ruhr basins—that is the scale of this future industrial region.

The extent of power development will allow for large-scale electrification of agriculture and rapid growth of consumer and food industries. Cheap electricity—Siberian power can be produced at a cost 50 to 75 per cent lower than in other parts of the country—will greatly reduce production costs of manufactured goods.

There is one other factor which is being considered in the specialization of Siberian industry—the relatively low density of population in Eastern Siberia by comparison with the European part of the country. Initial development, therefore, will concentrate on industries which rely heavily on heat and power but require less labor and capital expenditures.

In time a single power system will supply all of Soviet Asia. It will unify the hydroelectric stations of Central Siberia, the Lena Cascade, the stations on the big tributaries of the Lena, and the hydropower stations to be built in the icy Northeast. Transmission lines will tie in the power systems of various parts of Siberia with those in the European part of the Soviet Union to form a single power system for the entire country.

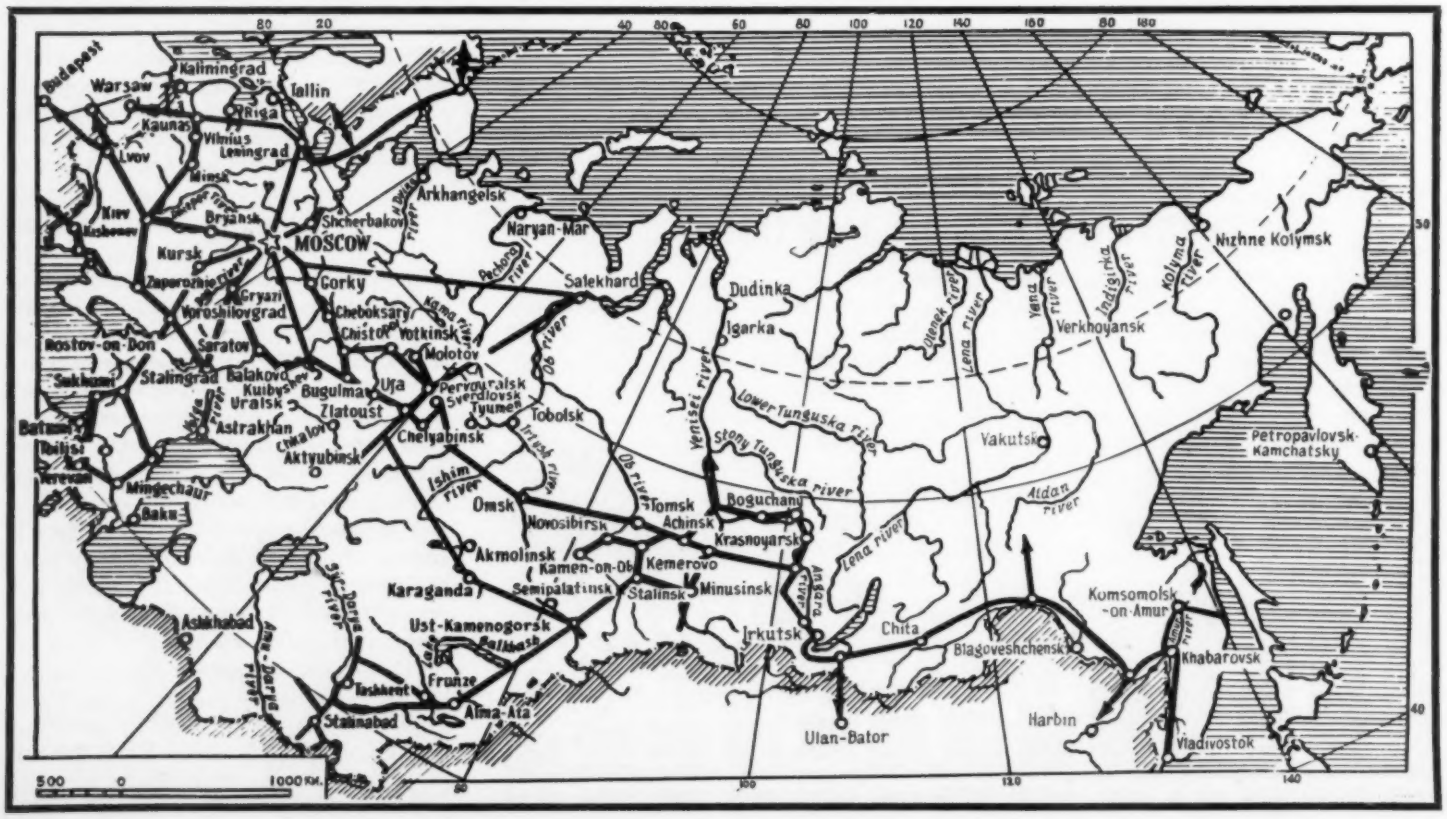
Projects for stations on rivers east of Lake Baikal and in the Far East are now in the planning stage. An over-all plan for harnessing the Amur, which serves as the frontier between China and the Soviet Union, is being worked out jointly by the two countries. In addition to power development, the plan is considering methods for doing away with the disastrous seasonal floods and for improving navigation.

What of the Future?

To plan forty years ahead, for the year 2000, it becomes apparent, is hardly idle dreaming. Forty years ago plans to harness the Angara and the Volga were thought daring fantasy. In 1920 when Lenin proposed the GOELRO Plan, designed to electrify the country in 10 to 15 years, it was considered by some to be grandiose, impossible in a country suffering from famine, epidemics, foreign blockade.

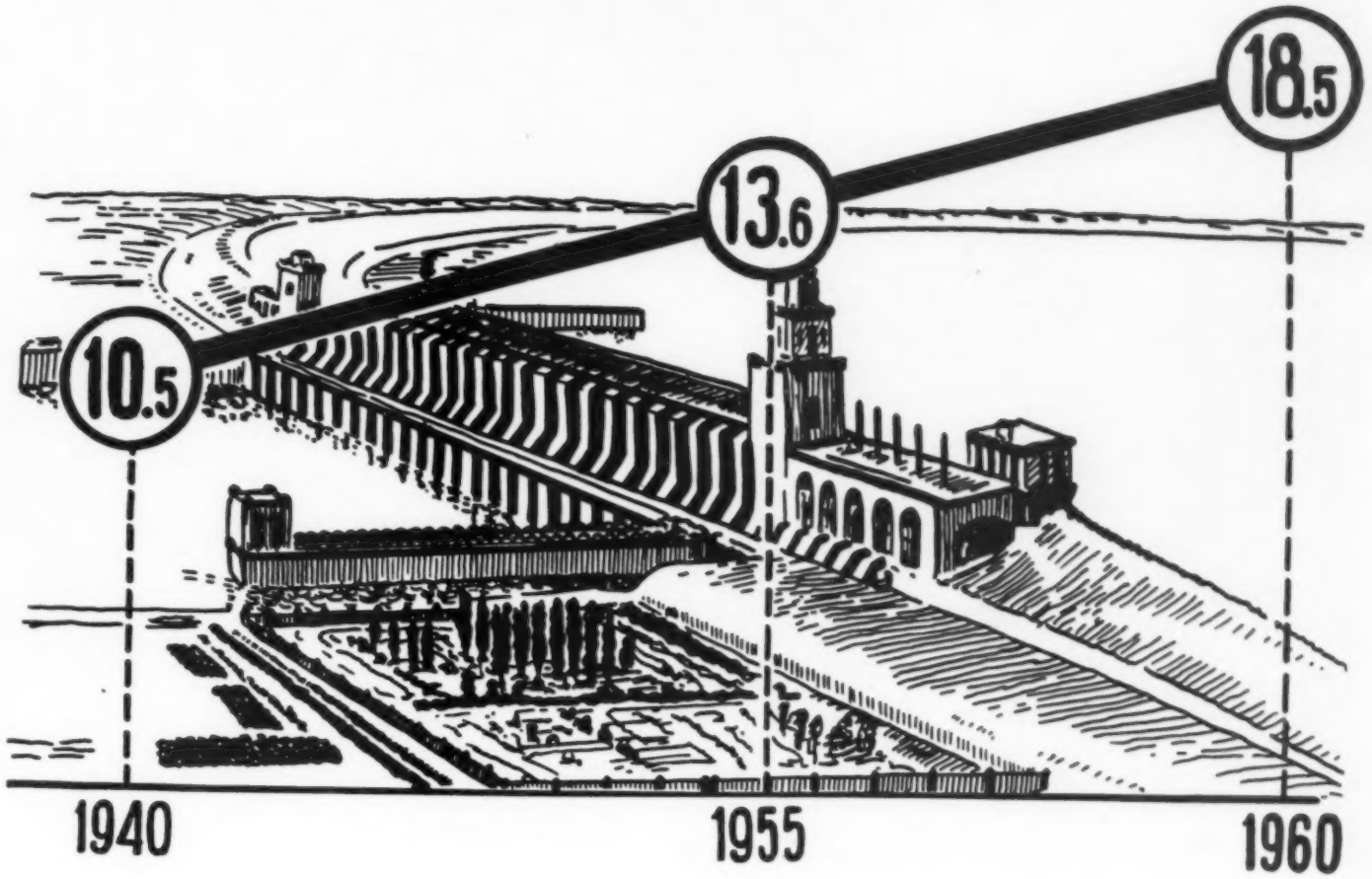
In 1921, H. G. Wells visited Lenin. They spoke of this plan for the electrification of the country. Wells wrote: "Can one imagine a more courageous project in a vast flat land of forests and illiterate peasants, with no water power, with no technical skill available, and with trade and industry at the last gasp? . . . . I can not see anything of the sort hap-

A CHART OF THE PROJECTED MAIN LINES OF THE USSR POWER SYSTEM OF THE FUTURE. THESE LINES WILL MAKE IT POSSIBLE TO EXPORT POWER TO OTHER COUNTRIES.



GROWTH OF POWER OUTPUT GENERATED BY HYDROELECTRIC STATIONS IN THE USSR

(In percentages of the total)



pening in this dark crystal of Russia, but this little man at the Kremlin can; he sees the decaying railways replaced by a new electric transport, sees new roadways spreading throughout the land, sees a new and happier communist industrialization arising. While I talked to him he almost persuaded me to share his vision. . . ."

The "visionary" plan was carried through in the minimal 10 years. By 1931 it had been fulfilled. Today the material facilities and the technical knowledge are available in infinitely larger measure to meet the demands of this greater plan—to build these chains of great hydroelectric stations, these thermal and atomic stations of enormous capacities, to create artificial seas, to shift the waters of the Siberian rivers southward to water the Central Asian desert, so that millions of acres of arid land become food-producing.

One can only make the roughest estimate of electric power production by the end of the century. But the guess is more likely to be short than long. By 1960 the Soviet Union will produce 320 billion kilowatt-hours; by 1972 the figure will reach 800-900 billion kilowatt-hours. By the year 2000 the country will be producing the astonishing total of 10,000 billion kilowatt-hours. With the concommitant rise in production of goods of all kinds, it will bring in an era of abundance.

The development of power in the USSR reflects general progress in this area on a world scale. Exchange of ideas and technical knowledge go on regardless of political differences. There is no country which has a monopoly of creative ideas, no country which can progress without drawing on the experience of others.

From its earliest days, the Soviet Union has been striving for broad scientific and technical cooperation because the vital interest of all nations demands it. It was as far back as 1921 when Lenin declared that modern advanced techniques urgently demanded the electrification of the whole country—and a number of neighboring countries—according to one plan; that such an undertaking was quite feasible. He proposed the idea of a railroad from London to Peking, via Paris, Berlin, Warsaw and Moscow.

Present-day power engineering is able to transmit electricity for vast distances, to feed international electrified railways, industry and agriculture. Truly limitless prospects are open for international gas and oil pipelines and, in the future, perhaps for oxygen and hydrogen pipelines. There is, too, the ever-growing need of international water conservation planning and for international forest conservation, to consider only a few problems that are common to every country.

From the technical viewpoint there is nothing that stands in the way of cooperative international efforts in power development. There is, as a matter of fact, some advanced thinking already being done along these lines. Kilowatt-hours can become common currency in international trade.

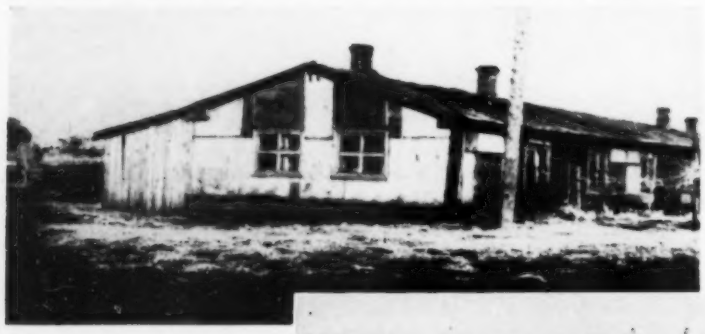
The establishment of a single Soviet power system will reasonably bring about a junction of its eastern sector with the Chinese power system. In the West it will as reasonably merge with the power systems of the socialist countries of Europe. It would be of mutual benefit to tie in with the power systems of Finland and Norway. The first step in this direction has already been made with plans for joint exploitation of frontier rivers.

Possibilities are present for international flood control, for intercontinental waterways that would irrigate the Gobi Desert, the Sahara, arid lands in every one of the six continents. There is even the possibility of thawing the great frozen regions of America and Eurasia, of remaking climate and freeing the immeasurable natural wealth that is buried under Arctic and Antarctic ice.

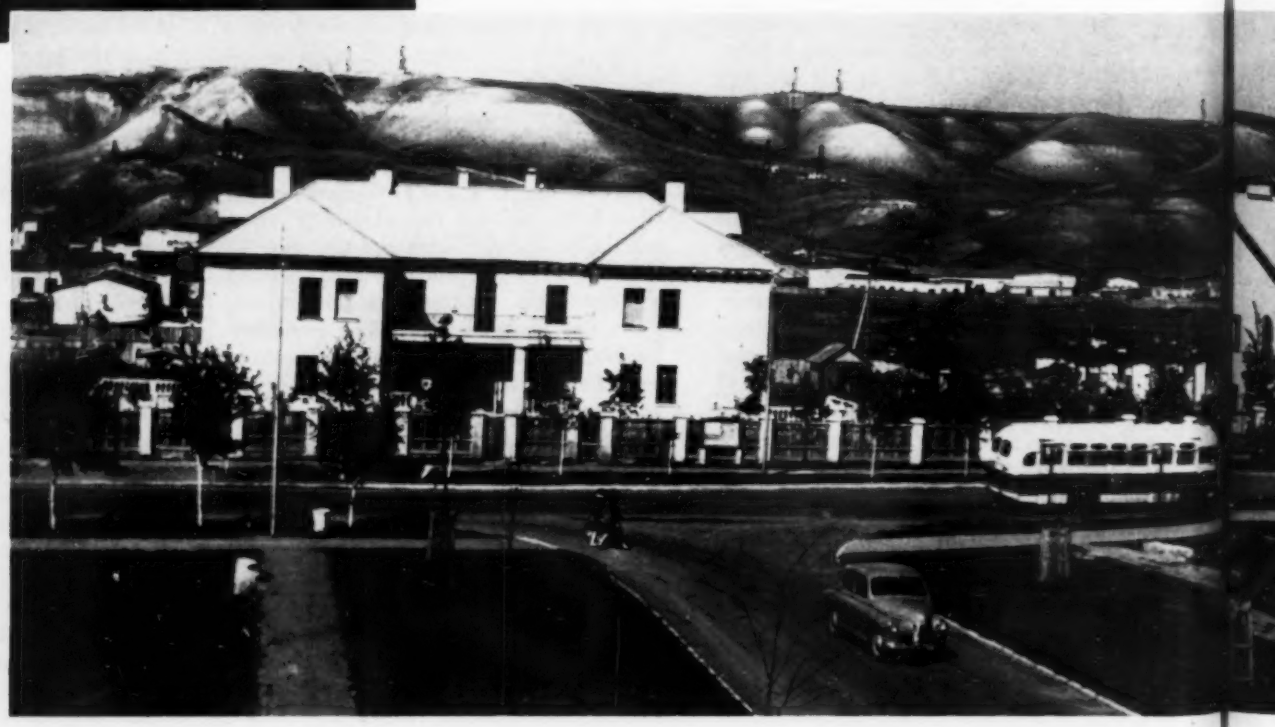
The means are at hand, the knowledge is available. What is most necessary is the international will to joint labor for a common future that will forever end thirst, hunger, scarcity. ■

A FEW OF THE COUNTRY'S 900 NEW CITIES WHICH HAVE SPRUNG UP SINCE 1917.

THESE ARE THE FIRST LIVING QUARTERS USED BY THE FOUNDERS OF OKTYABRSKY.



OKTYABRSKY—



City of Black Gold

By Anver Bikchentayev, *Bashkir Writer*

OIL workers call it the "White City of Black Gold." It is an apt phrase for Oktyabrsky, the new oil center in the Bashkir Autonomous Soviet Socialist Republic in the southwest Urals, a radiating city with a population of 70,000 that grew up around a cluster of temporary wooden cottages built to house oil prospectors in 1938.

I remember this Bashkir country in my youth. It was a land of great and quiet expanses. One could ride horseback for hundreds of miles and see nothing but steppe, nothing but the golden eagle or the black kite winging overhead to break the emptiness of the desolate plain. It was a land of few towns, of nomad shepherds and grain farmers, of unchanging ways and ancient superstitions.

Bashkiria has been transformed over the years. The republic now has a population of more than three million. There are many industrial enterprises and the area is one of the most important oil sources in the Soviet Union.

A number of new cities have grown up, such as Ishimbai, Saran, Alzamai and Oktyabrsky. Most have been founded within the last few years and they demonstrate the rapid industrial progress of a once undeveloped area. The descendants of illiterate nomads have become industrial workers, engineers and doctors, schoolteachers, cultured farmers and agronomists.

The settlement of Oktyabrsky had no name in 1938, it was simply a number of wooden houses, a laundry and a bakery grouped together on the grassy plain. Six years later it was on the way to becoming a city.

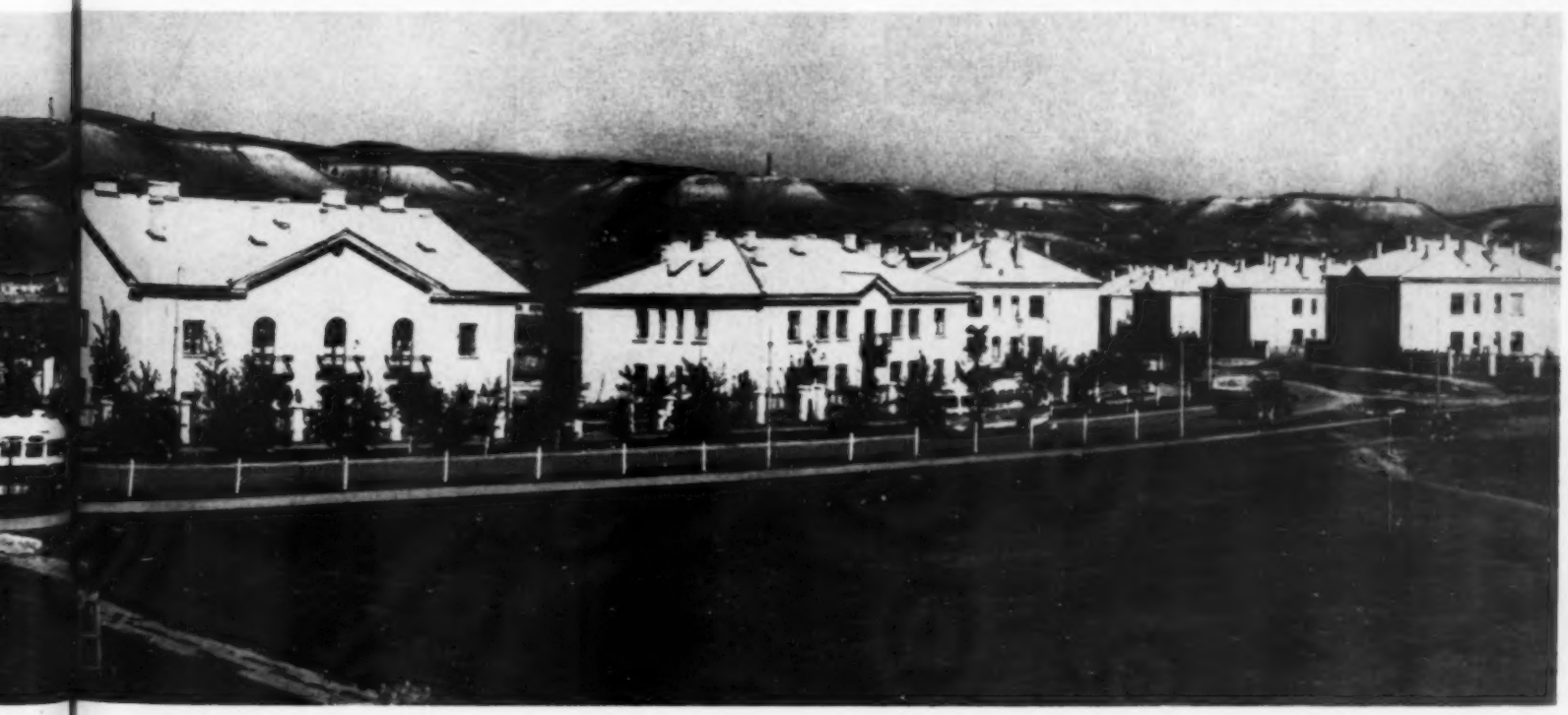
Lake Akai-Kul, near the village of Zaitovo, according to an old folk tale, was devil-ridden. Satan himself lived on its shore, waiting to grab the unwary who walked there after dark. The lake was said to be bottomless and old people warned that a man who ventured on it would do well to prepare his will beforehand.

These old tales cropped up again with new improvisations when strangers arrived with tools and instruments about thirty years ago. To begin with, they erected a shack for their instruments and tents for themselves. They listened to the old stories about the "accursed" lake, smiled a bit and went on with their work, measuring and tapping and surveying the shore and the land about the lake. These were prospectors who sounded the depth of newly discovered Tuimazy oil deposits.

Continued on next page

ONE OF THE CITY'S 14 SECONDARY SCHOOLS. TOTAL ENROLLMENT IS NEAR 8,000.

OKTYABRSKY'S MAIN STREET IS NAMED AFTER IVAN GUBKIN, NOTED SOVIET SCIENTIST, WHOSE RESEARCH LED TO FINDING NEW OIL FIELDS THROUGHOUT THE COUNTRY.



OKTYABRSKY—*City of Black Gold*

Continued

THE MOST MODERN EQUIPMENT IS USED IN THE CITY'S BUSTLING OIL INDUSTRY.

Then other men came and built steel towers twice the height of the minaret of the village mosque. The tool shack was the first building in the still unnamed city of Oktyabrsky. Over the past 20 years the city has grown by leaps and bounds and it continues to expand. It is a comfortable city now, with electricity, modern plumbing, telephone and radio service. Building has proceeded at a steady pace, interrupted only by the war. Some 7,000 new housing units were erected within the past ten years alone.

Building of private houses has been encouraged with the help of long-term loans and materials. There are broad avenues there now lined with both one- and two-family houses in the western and southern districts of the city. Each of these houses has its own small orchard of apple trees, berry bushes and grape vines.

Oktyabrsky is an oil town and many of its 95 streets bear names relating to that industry. The oldest street is Devonskaya, derived from Devonian, the geologic age. Gubkin street is named for a noted Soviet petrologist and is the business center of the city. The favorite street for strolling is Sverdlov Street, with its wealth of greenery and flowers.

New Cities on the Map

How, where and why do new cities arise? They have been springing up because of the industrialization of the country and the harnessing of new areas to the nation's economy. The distribution of these cities is very instructive. During the Soviet period the number of cities east of the Urals has more than doubled.

New towns rise near mineral deposits, at the sites of huge hydroelectric power plants, and on major river and sea routes. A geologists' camp that stood in the steppe near Kustanai two years ago has grown into the town of Rudny, whose inhabitants are developing its rich iron ore deposits. It is the same way everywhere: a steppe grain port, Volzhsky, rose on the Volga River; the lead and copper town of Almalyk in Uzbekistan; the oil town of Almetievsk in the Tatar Autonomous Republic.

The story of the new city of Oktyabrsky is also the story of the men and women who founded it. In my own case I have seen both Oktyabrsky and its people change right before my own eyes.

Let us take a few typical examples. There is the membership of the Oktyabrsky City Soviet which includes K. Saderdinov, a loader foreman, and M. Sipaev, a painting foreman. They sit alongside C. Batershin, a drill operator; N. Nabiev, a concrete worker; and N. Strekalov, a lathe operator. Each of these men, and hundreds of others like them, developed their skills and qualifications by studies in the technical and

Continued on page 40

RAISA PODOSENOVA, A CHEMICAL ENGINEER, WORKS IN THIS GAS RESEARCH LAB.

THE AUDITORIUM OF THE CITY'S ENGINEERING CLUB IS FILLED EACH EVENING.

THESE AMATEUR DANCERS PERFORM THE POPULAR BASHKIR DANCE, "THE GIFT."

OKTYABRSKY—*City of Black Gold*

Continued

specialized schools of the city or at on-the-job training courses.

These training courses are very popular in Oktyabrsky, and the various technical studies draw more than 3,000 workers into classes. Only recently a branch of the Scientific Geological Research Institute was opened in the city. It is busy today training skilled geologists who will soon join the working population to add to the city's steady, planned development.

Needs grow as a city develops. Not very long ago a single school, a dispensary and small library sufficed. Today Oktyabrsky has six clubs, 21 motion picture houses, 57 libraries and a school enrollment of almost 8,000 youngsters. A specialized secondary school for oil technicians has 1,500 students. There are eleven kindergartens and nine nurseries to serve the children. There are 70 medical units of various kinds with combined staffs of 560 doctors and nurses.

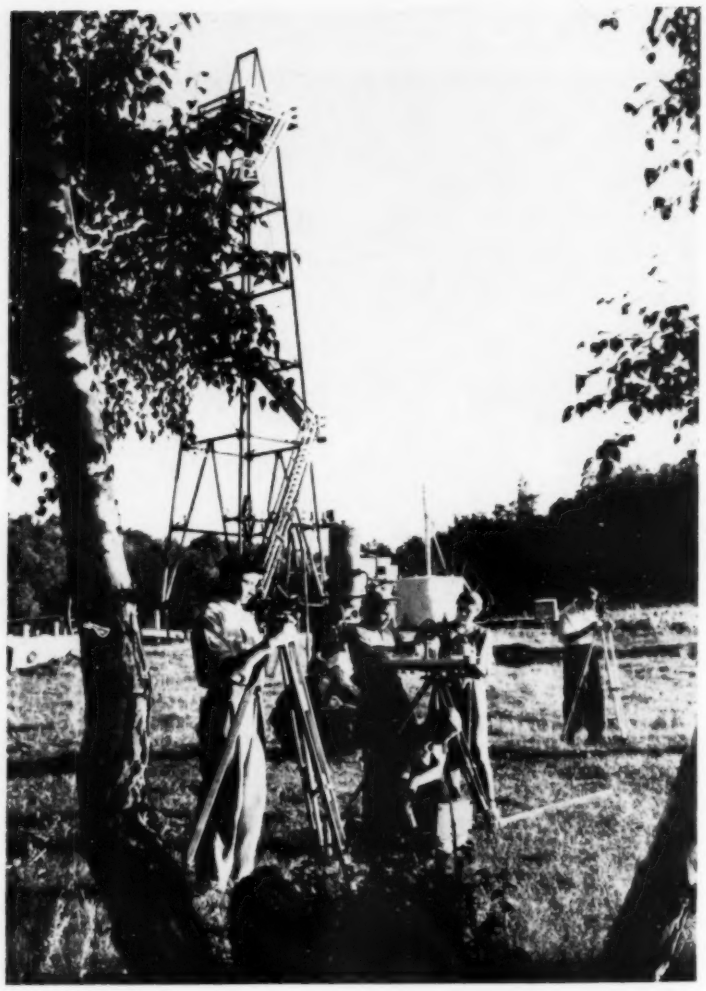
The House of Culture, which is a big community center, has two amateur theater groups presenting plays both in Bashkir and in Russian, besides all sorts of clubs for gymnasts, photographers and hobbyists.

It is startling to think of all the changes that have taken place in my own lifetime in Bashkiria, and I am not an old man. There was much that was instructive, interesting, and sometimes even amusing in the struggle against the survivals of the past.

I have seen old women who refused to move into the new houses, dreading the gas ranges. The samovar continued to be used in many homes although it was much easier to boil water for tea on the gas range. Old people forbade their children to go to the theater. Painting was prohibited by the Mohammedan faith, and the elders in some families did not allow any pictures to be put up on the walls. Twenty years have passed since then, and it all seems quite unreal now.

We take the changes for granted these days. Nobody even blinks an eye when there is talk about plans for controlling the weather. The dry southern winds churn up violent dust storms in the region. Oktyabrsky is planning to grow shelter belts of trees to block these devastating winds. And this in a region that was wild, thinly populated steppe no more than 20 years ago.

There is no easy explanation for all this remarkable growth. But a large part of it can be found in the character of the people themselves. From a nomadic past with all the superstitions and fears of generations, they have become an educated, industrial people. ■



SENIOR STUDENTS OF OIL INDUSTRY SCHOOL GETTING EXPERIENCE IN THE FIELD.

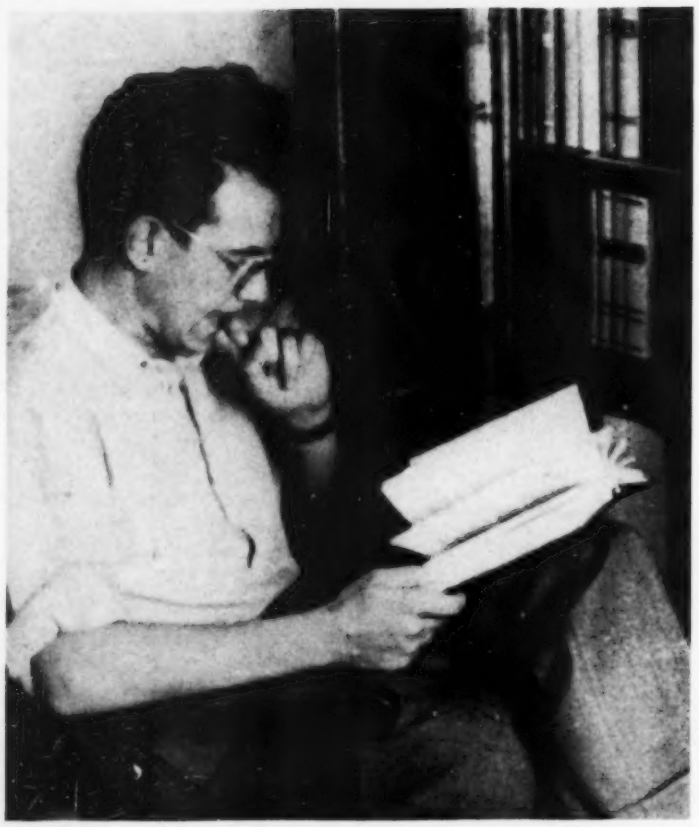
OIL WORKERS' CHILDREN LEARN TO PLAY AN INSTRUMENT AT A LOCAL MUSIC SCHOOL.

ENGINEER TUKHVATULLIN IS READY TO GO ON A FISHING TRIP WITH HIS SON.

TRADITION SAYS THAT TREES ARE TO BE PLANTED IN YARDS OF NEWLY CONSTRUCTED SCHOOLS, AND CHILDREN OF SUCCEEDING CLASSES PROVIDE THEM WITH GOOD CARE.

FOUR YOUNG SOVIET PEOPLE

These are four young people, a student from the Volga region, a geobotanist from Yakutia, a shoe worker from Leningrad, a farm girl from a village near Moscow. They have certain ways of life in common with the millions of other young people who have been born and brought up in the Soviet Union. Otherwise they are as different from each other as any four young people chosen at random anywhere else in the world.



STUDENT

Oleg Skobelev

By Vladimir Razumnevich

OLEG SKOBELEV is twenty-two. He is in his fifth year at the Kuibyshev Industrial Institute where he is taking an electrotechnical course. He likes the work he has chosen but this year of college before he gets his engineering diploma seems to be dragging.

He has any number of job choices but he has pretty much made up his mind to work at one of the Volga hydroelectric power plants after he graduates. He comes from the Volga region where several stations have recently been completed and more are under construction. He hasn't yet decided which one he wants to work at.

One definition of a student is: a person who never has enough time for all the things he wants to do. Besides lectures, classes and laboratory work, there is outside reading to be done. Oleg does considerable reading in his own field and in general literature. His favorite Russian writers are Tolstoy, Gorky and Sholokhov. Among the Americans he likes Mark Twain and Hemingway.

He is editor and staff artist for the student satiric magazine called *The Fillip*, and admires Picasso. Some of his friends think Picasso's work too abstract, and there are frequent arguments at the student club on the subject with Oleg holding forth. He is something of an authority on Picasso by virtue of a collection he has made of reproductions of the artist's paintings and a film on Picasso's work he saw in Czechoslovakia last summer on a vacation trip.

There are 97 men and 73 women in Oleg's class and a good deal of social life centers in the student club dances and get-togethers.

Oleg lives at home. His father is dead and he devotes part of his day to helping his mother keep house and prepare meals. He isn't a bad cook in his own right. When he doesn't eat at home, a good meal is available at the Institute restaurant at a very moderate price.

Oleg, like other students in the country, pays no tuition fees. Since he is making satisfactory progress in his classes, he gets a government stipend of 480 rubles a month.

Last fall Oleg, together with other Institute students, went out to Kazakhstan to help get in the harvest. What he found even more rewarding than the extra money he made was the rich experience of living and working with other young people from distant parts of the country.

GEOBOTANIST

Natasha Korolyova

By Semyon Sidorov

NATASHA KOROLYOVA is a member of one of the many scientific groups—geologists, botanists, meteorologists—a young woman in what might be called the "restless" professions who are on expeditions to places in the far corners of the world. Natasha is a geobotanist and is now working in Yakutia. Her work is absorbing but it demands great patience, energy and even sacrifice. For weeks and months sometimes Natasha is separated from her husband Yura by thousands of miles.

These are notes from Natasha's diary:

"And so my expedition has sent me to the Middle Kolyma region of the Yakutian Republic where I am to survey pasture for reindeer and horses on four large collective farms. I am to define the borders of these big pastures and check the kind and quality of feed they grow. I shall have to map 500,000 acres and to do this I shall be traveling some 400 miles. I am responsible for seeing that each collective farm gets pasture of quality and size required for the kind and number of head of stock it has.

"I can't stop marveling at the hugeness of this region beyond the Arctic Circle. It covers 1,158,000 square miles. We do our traveling by sledge and try to take advantage of every hour of good weather.

"This last trip out from the base took a month. There were four of us—Yura, our interpreter Kim, the driver and I. The liveliest of us was Kim who had just come from Yakutsk and gave us the latest news: The National Theater was rehearsing for *Romeo and Juliet*. Big news coming from Yakutsk considering that in the old days the Yakutians didn't even have a written language of their own. To underline the fact Kim told us that 1,200 Yakutians had just finished the first course of the university.

"Our sledges bumped over jagged rocks, doing terrible things to our backs and legs. We kept bouncing to the right and left, hardly managing to keep our heads and faces away from overhanging branches. The snow was dazzling and our eyes ached. My dark glasses came in very handy here.

"After days of this traveling, or weeks—you lose sense of time on a trip like this—we came to a huge stretch of brilliant ice, the river broadening near the estuary. It was difficult riding. We had to kick at the ice while sitting on the loaded sledges to help the reindeer keep moving. The banks and islands were covered with trees shining with diamond hoarfrost, and I felt as if we were flying over Swan Lake ballet scenery. The ice in spots was covered with water—a most unpleasant and dangerous thing for us then. In spite of the bitter cold, we got wet with perspiration and got our fur boots soaked as well.

"There was one day we could make only four and a half miles. Our destination was twice that distance from us. Suddenly we saw a small tent on the steep shore of one of the islands.

"It belonged to deer herders—Semyon Zabolotsky and his wife Maria. They were heaven-sent because it was getting dark and we were exhausted. The couple couldn't speak a word of Russian but with their hospitality we made out.

"The first thing to do was to clean up and wash. Our bathhouse was our tent. Clean and happy we took our places around the "table"—a big tin box covered with canvas.

"During the meal, after the warm exchange of greetings, there was lively talk in the Evenki, Yakutian and Russian languages: Semyon Zabolotsky was a Yakutian, his wife Maria and grandmother Agafia, Evenkis. Kim nearly lost his head, hardly able to translate one language into the other fast enough. He was constantly harassed with the demand: 'What did he say?'

"Then came tea and cookies, and pastry which had been saved for a special occasion. We were all very pleased. But the best of it was the amateur concert that followed.

"The first to volunteer was grandmother Agafia. She sang a song that went smoothly enough, the rhythm being tapped off very regularly as though it were a song that had been made up long ago. Actually, she made it up on the spot. Then came Zabolotsky's turn by popular demand. He set another very even and rather unchanging song going, but this time a Yakutian melody. His song, like grandmother's, was improvised at that very moment, but he went on and on hardly catching his breath, never hesitating.

"Then we, the members of the expedition—Yura, Kim and I—sang some Russian songs.

"We returned to the base of our expedition after making many surveys and collecting plants for study.

"The Polar night has set in and the wolves won't let us sleep. One night they seemed to be howling right alongside of our tent. It was the usual 'serenade.'

"We see the northern lights very often. They're different here than in the tundra, but no less splendid.

"I am preparing for a long trek and a life in tents with plenty of mosquitos around. What if my relatives are in Moscow and my husband, Yura, at the other end of Yakutia! I'm sure he thinks of me no matter where he is!

"There are some people who would like to commiserate with me for the profession I've chosen; they actually pity me. But they don't have to. There is nothing I can think of that I'd rather be.

"Yura and I have our 'own' star—Venus. When we are separated we look at it and think of each other. In his last letter Yura asked me if I keep looking at it. But how can I? We haven't any stars at all just now, because it is day all the time. What is a girl to do?"

Continued on next page

SHOE WORKER

Valeri Piskaryov

By Elena Doroshinskaya

VALERI PISKARYOV is a press operator in the Skorokhod Shoe Factory in Leningrad. He is the seventh shoemaker in his family, the first was his grandfather. Valeri hadn't intended to go into the trade. He had gone through secondary school and had taken college entrance examinations for the Leningrad Polytechnical Institute. The examinations are competitive, with places open for only 1,900 in the entering class. Twice as many took the exam, and unfortunately Valeri's marks were not high enough.

He could have gone into one of a dozen different trades. "Help Wanted" signs are plastered all over Leningrad. But talk in the family has been about shoes ever since he can remember, so that he went to work as an apprentice at the Skorokhod factory, the same one his grandfather had worked in.

It didn't take him long to learn his way around the huge shoe factory with its complexities of automatic tools. Inside of a month he was working a press independently, punching cardboard parts for shoes. He felt that he had the job well in hand and wanted to get on to work with leather. But the foreman thought he needed more training. Work with leather, he told Valeri, needed much more skill than working with cardboard.

Valeri now spends a good deal of time after work in the factory laboratory learning how to cut leather. He is making quick progress there and on his own job and has been getting bonuses for economizing on material.

Valeri is eighteen and like most teen-agers has an abundance of energy and a vast curiosity about things mechanical. He has just gotten through making up his own tape recorder. His mother has a notion—very likely it's so—that by the time Valeri had bought the parts, tools and incidental items, it had cost more than a bought tape recorder would have. But Valeri is convinced that his home recorder has a superior tone. Be that as it may.

Alongside that, he goes in for photography in a big way. Ever since he got his camera as a graduation gift, he has been taking pictures of anyone he can persuade to stand still long enough and spending hours in his improvised dark room—Valeri won his first public recognition when a group of photos of an overnight hike that he and some of the other young people took was displayed at the factory.

Hiking has long been one of Valeri's passions and he has managed to infect quite a number of other young people with his own enthusiasm. The factory sports council provides tents, rucksacks and cooking equipment and on Saturdays the boys take the train to a spot thirty miles from Leningrad and hike through the woods. The picture display was of a hike they took to the celebrated Korabelnaya Grove, woods planted, so the story goes, by Peter the Great way back in the early 18th century. Valeri is now on his latest enthusiasm, sailing on the Gulf of Finland.

Like most of the young people in the Skorokhod factory, Valeri goes in for sports. He inclines to volleyball which, incidentally, takes third place in national popularity after soccer and chess. He's not too bad a chess player and he rates as a good dancer at the factory balls.

Although Valeri proposes to continue making shoes—he is well on the way to becoming a skilled, high-paid worker—he hasn't given up his ambition to get a college education. He is planning to go ahead with his studies while working, either at the evening division of the Leningrad Institute for Light Industry or through the Industrial Institute correspondence course.

FARM GIRL

Nina Pylnova

By Alexei Grigoryev

NINA PYLNOVA graduated from secondary school two years ago, and she could either have gone on to college or taken a city job. Many of the girls in Timonino village where she lives do one or the other.

But Nina knew what she wanted. She had lived on a collective farm all her life and she liked farming. When she was small she used to tag after her mother to collective farm meetings and listen to talk about seeds, fertilizer, tools. It was all very much part of her life.

At first Nina toyed with the idea of going to work on one of the virgin land projects. Many of her friends had done it and it sounded like a real adventure. But her mother was old now, and she and Nina were very close. She had been both mother and father to the girl since her husband had died when Nina was not even two weeks old. Nina's mother had worked hard on the farm and everybody knew her here. Besides, she had not been well lately, and there could be no question of Nina's taking her along. So, reluctant to leave her mother, Nina decided to start working on the farm.

A few months after Nina had joined the collective farm and had become a full-fledged member, she was appointed leader of a field unit. At first, it was anything but simple. It's one thing to answer for yourself, quite another to be responsible for a group of people on a small job but one on which many other of the farm jobs depended. Nina was only nineteen then.

This kind of situation developed. The farm schedule called for sowing beetroot, but the weather was nasty—no sun, no warm wind. The farm management was getting nervous with time passing and planting not yet started. The very first sunny day Nina and all the other farm people got instructions to start sowing.

But shortly after they got to the fields, Nina started back with her team. One of the members of the farm board yelled after her angrily, "Where do you think you're going, running away from work?"

Nina has been brought up to respect her elders, even testy ones like the farm board member, and she explained politely and patiently that the soil was still frozen and that sowing couldn't be done yet. They would have to wait until it was warmer.

But the older man was edgy by reason of the time lost and he wouldn't have any of it. He told her to go back to work. It was far from an easy thing to stand her ground but Nina did. And when the matter was taken to the farm board, Nina's judgment was upheld and sowing was postponed until the warm winds started blowing from the south. The sowing was late but it was better than having the young shoots freeze on the stalk.

The important thing that Nina learned from this encounter was that she had better learn more about scientific farming. She hadn't been nearly as sure of her judgment as she sounded. She and her teammates, Nadezhda Novikova, Ludmila Agapova and Nina Sorina, stayed up half a night talking it over and all decided to take a correspondence course at the Agricultural Institute in nearby Balashikha, one of the best farm schools in the country.

But there was the boy friend—Volodya. With work during the day and study at night, there wasn't going to be much time for him. Volodya Golikov is a tractor driver at a neighboring machine and tractor station.

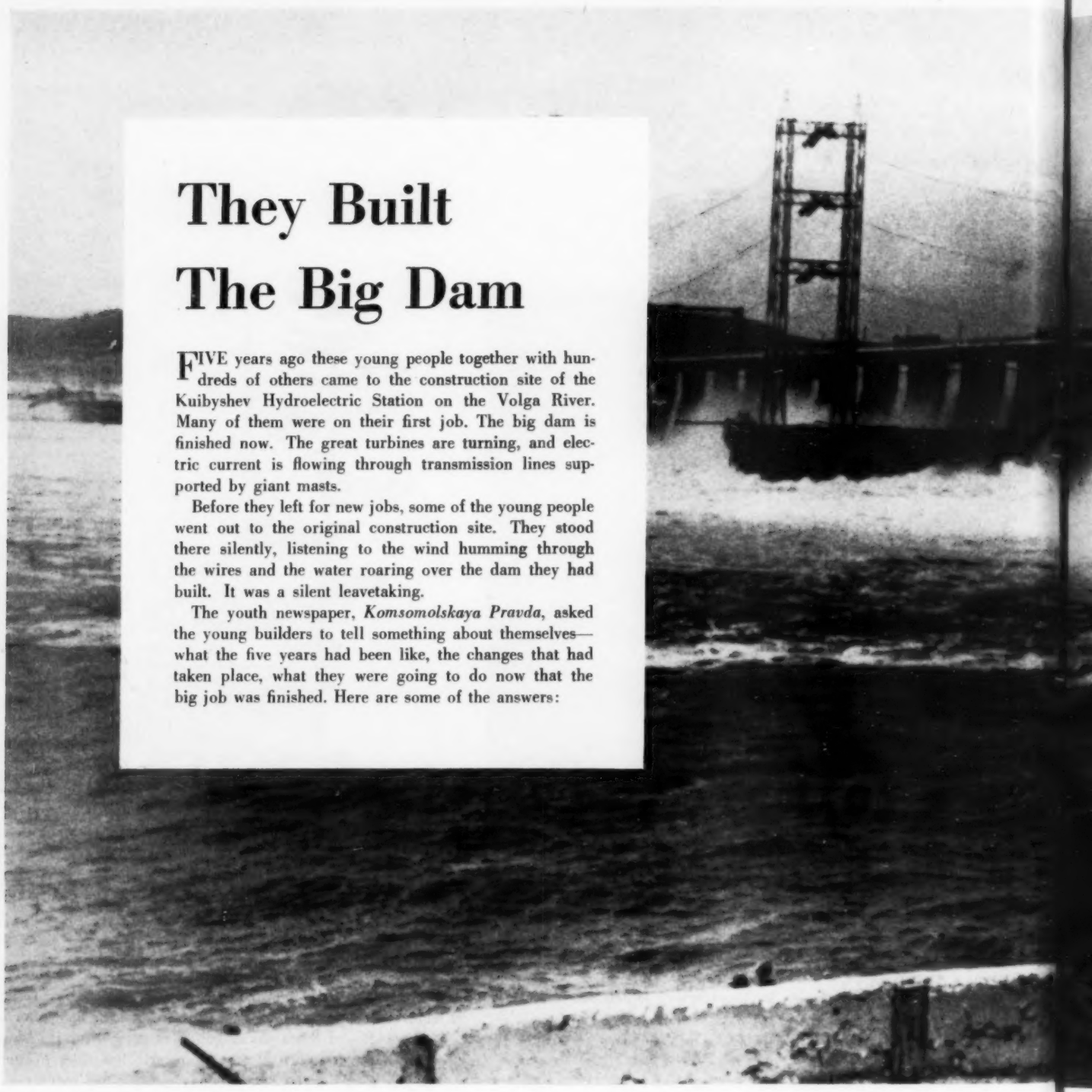
Now everything seems to be working out. There are a good many more hours in a week than people think. And Nina finds that there's time for work and study and Volodya and for the chorus she sings in and even for talk about clothes and hair-dos.

They Built The Big Dam

FIVE years ago these young people together with hundreds of others came to the construction site of the Kuibyshev Hydroelectric Station on the Volga River. Many of them were on their first job. The big dam is finished now. The great turbines are turning, and electric current is flowing through transmission lines supported by giant masts.

Before they left for new jobs, some of the young people went out to the original construction site. They stood there silently, listening to the wind humming through the wires and the water roaring over the dam they had built. It was a silent leavetaking.

The youth newspaper, *Komsomolskaya Pravda*, asked the young builders to tell something about themselves—what the five years had been like, the changes that had taken place, what they were going to do now that the big job was finished. Here are some of the answers:



"We've Been Happy Working Together"

"Changes in my life in these five years? Many of them. The most important one is connected with Tolya Vorontsov. We were married last year.

"I met him on the construction job here. He came out about the same time I did, an engineer. I was having problems then, working and studying at the evening division of the hydro-technical secondary school at the same time.

"It wasn't easy. Half a dozen times I felt it was too much for me and I was ready to give up. But Tolya wouldn't let me. He encouraged me, scolded me, helped me with my books and drawings night after night. We got married when I finally received my diploma as a hydrotechnician.

"The Kuibyshev Hydroelectric Station is finished and our job is almost over now. We're sorry and glad at the same time. Sorry because we'll be leaving the place where we've been very happy, glad because we're going on to a new construction job together."

—Maria Vorontsova

"Wherever Our Next Job Takes Us"

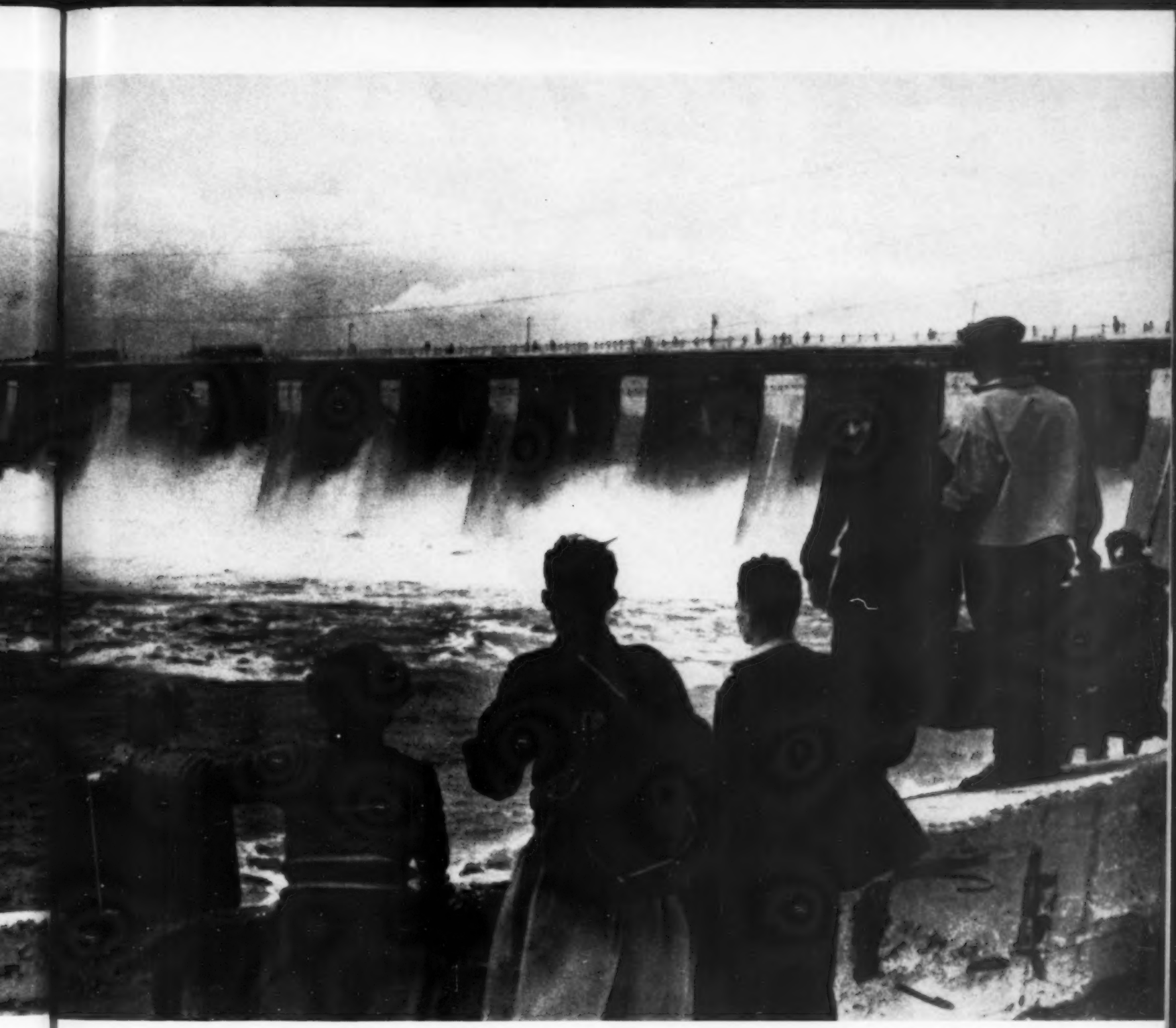
"My husband and I both graduated from the institute, married and took our first job on the Volga-Don construction together. We had no sooner settled down when the job was finished and we came here.

"These five years seem to have flown by so fast that it's hard to note the changes—there have been so many of them. Now our house stands in the center of a big new city. From our windows we can hear the roar of the Volga as it spills over the dam. It doesn't seem like five years ago that we used to go walking on the Volga banks to gather flowers.

"But I suppose it must be. Yesterday I noticed a gray hair on my husband's temple. And then there are our two boys growing up. Dmitri, the first, was born during our first job on the Volga-Don canal. Our little Sergei was born here in Zhiguli, on our second. And we're expecting a third—a girl we hope this time.

"Where will she be born? On the Yenisei, the Angara, the Amur? It's hard to say right now. Wherever our next job takes us."

—Alla Borisenko



"I Learned More Than A Language"

"When I came here to work five years ago, I knew only a few Russian words. I spoke only Lettish. I stood there in the superintendent's office the first day I came and tried to explain that I wanted to work but that I had no trade or skill. Now I don't have any difficulty with the Russian language. But I learned much more than the language in these five years. I studied in the evening division of the institute and soon I'll be through with all the work for my engineering diploma. I have already put in my application for an engineering job on the big Bratsk Hydroelectric Station going up on the Angara River."

—Austria Balode

"A Kind Of Rebirth"

"A few weeks before I graduated, the editors of the college wall newspaper asked me, 'What do you think you will be doing next year?' I answered the question by handing them a sketch I made on the spot—me at the North Pole in fur boots, with one foot resting an a polar bear.

"Came next year. It found me not at the Pole but in the streets of Yalta. I had a navigator's diploma in my pocket and a doctor's certificate in my hands which read 'due to poor eyesight, the bearer will be unable to work at his profession.'

"So much for my dreams. . . .

"How I came to work on this construction job? It's something I'll be eternally grateful to my friend Ilya Orlov for. When he learned what had happened, he wrote me, 'Perk up and come out here. We'll work it out. You can get started here on a job where your eyesight won't be a handicap.'

"I came out. Ilya took care of me like a brother. I began working as an apprentice at the power station and became an electrician. It was a new life for me. There was too much going on here to worry for long about the past. It was as if I began to glow again as the big dam grew, a kind of rebirth.

"I look at these mighty waters rushing over these great concrete walls and I think of it as the energy of the thousands of workers who helped build it—my share is in it too. It's something to be proud of."

—Victor Razumov

MULTI-BUCKET EXCAVATOR MAKES SHORT WORK OF TOUGH DIGGING AND SOON HAS A DRAINAGE CANAL COMPLETED TO RECLAIM ACRES OF RICH FARMLAND FOR CROPS.

Making Farms in Deserts, Orchards in Swamps

By Sergei Petrov, **Hydraulic Engineer**

WATER is a blessing, the people who live in the Central Asian deserts and the steppelands of Kazakhstan and the southern Ukraine used to say. In southeast Russia, folklore had it that to dream about water was an omen of good fortune.

In Meshchera, a great marsh in the heart of the central Russian plain, to dream about water is to expect bad luck. "Water is a curse," the old saying goes in Byelorussia, Lithuania, Latvia and the Kolkhida lowland in the Caucasus.

Nature has portioned out water with an erratic hand in the two-continent Soviet Union with its heterogeneous climatic zones. On the eastern Black Sea coast around Batumi, yearly rainfall is almost 100 inches; in Byelorussia it is 20 inches, in the plains east of the Volga River it is 10 inches and in the lower reaches of the Amu-Darya River near the Aral Sea it falls to a low 3 inches a year. Compare temperate United States with its range from 67 annual inches for Alabama, the wettest state, to 7 inches for Arizona, the driest.

Ever since man began to grow his food, he has been trying to correct the inequities of nature's water distribution by draining marshlands on the one hand and irrigating deserts on the other.

In pre-revolutionary Russia this redistribution was done on an insignificant scale. Nature's inequities were further aggravated by the fact that the very limited supply of water in the dry south was used largely by the wealthier farmers. In those districts which now form part of the Turkmenian Republic, a not inconsiderable part of the population was deprived of water for irrigation. In keeping with ancient custom, only married men had water rights. Since water was imperative for farming, this was equivalent to depriving the peasant of land too. And since the young poor peasant owned neither land nor water, he had no way of saving bride-money for marrying.

After the Revolution, the century-old irrigation systems in these primitive regions were modernized and expanded. Instead of the old method which merely flooded the fields, mechanical irrigation directed the water along furrows. In place of low capacity canal networks with ancient devices to regulate flow, various modern mechanisms were built.

Later, when farmers joined their small private land holdings into large collective farms, a new and more efficient type of irrigation was introduced, one using temporary canals. In this system only the major canals are permanent, the large crisscrossing network of small ditches are cut by big machines before the irrigation season. At the end of the season the ditches are plowed up again. This makes for better irrigation over a wider area with minimum use of labor power and maximum use of machine power.

New Water Sources

With more water available the cotton and fruit growers of these once dry southern regions began to increase the land under cultivation. This required new and additional water sources. The waters of many rivers were drawn off completely, down to dry bed, during the irrigation season. Rivers like the Tejden and Murgab in Turkmenia were directed through a great interlacing network of irrigation ditches to cotton fields miles and miles from the river sources. The tributaries of the Syr-Darya River in Uzbekistan were diverted to water the cotton plantations of the Ferghana Valley.

Big dams were built to tap the water for power and irrigation on the Syr-Darya and the Amu-Darya in Central Asia, on the Terek and the Rioni in the Caucasus and the Don and the Dnieper in the south. These major irrigation sources with their canals now stretch for hundreds of miles to water tens of thousands of acres of once bone dry land.

One of the largest in Central Asia is the 200-mile Grand Ferghana Canal that carries the water of the deep Syr-Darya River not only to 440,000 acres of old farmland but also to 300,000 acres of new cotton fields and 134,000 acres of Ferghana Valley land that had lain barren for centuries for lack of water. Hydroelectric stations have been built on the Syr-Darya and its tributaries, and a cascade of power stations stretches along the Chirchik River.

Great areas of the once aptly named Hungry Steppe in Kazakhstan and Uzbekistan have been reclaimed. Year by year the Kara-Kum Canal that carries water from the Amu-Darya River pushes further into desert land. The Vakhsh Main Canal now waters thousands of spreading acres of orchards and melon fields, once desert, in the Tajik Republic.

Where growers thought .28 to .32 tons per acre of raw cotton a good crop not so many years ago, they now grow 1.6 to 2.4 tons. The average cotton yield is better than a ton an acre. Comparable yields are true for rice plantations, orchards and vineyards.

Extensive irrigation systems have likewise been built in Kazakhstan, the Caucasus, southern Ukraine and the Crimea. The completion of the Mingechaur hydraulic project on the Kura River provided Azerbaijan with a reservoir to store enough water to irrigate some three and a half million acres. In southern Ukraine work in under way on an irrigation system channeled from the new Kakhovka Reservoir on the Dnieper River and the huge Crimean Canal now under construction. There is much being done also to irrigate land on the western shore of the Caspian Sea. in the steppes beyond the Volga and elsewhere.

The sweep of this irrigation work is strikingly evident when one looks at progress in the individual republics. In the Uzbek Republic alone more than 800 irrigation systems have been built with a total canal length of 100,000 miles. In the small Armenian Republic whose

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SPECIAL MACHINE THAT SHAPES AND CLEARS CHANNELS EQUALS WORK OF 500 MEN.

THIS FARM CANAL WATER REPRESENTS REAL LIFEBLOOD FOR TAJIKISTAN CROPS.

FLOW GATES DIVERT WATER ACCORDING TO THE REQUIREMENTS OF THIRSTY LAND.

EXCAVATOR AT WORK ON A NEW IRRIGATION CANAL IN THE SOUTHERN UKRAINE.

Making Farms and Orchards *Continued*

total area is less than 12,000 square miles, 340 miles of main-line canals and hundreds of reservoirs and pumping stations have been built, sufficient to irrigate 520,000 acres.

Swampland Reclaimed

Frequently, within the boundaries of a comparatively small region, there will be work going on simultaneously to get more water to one spot and to drain water from another. This is true in the Georgian Republic with its dry central and eastern regions and its wet Black Sea coast. Sown land that is irrigated totals 850,000 acres, drained land totals 250,000 acres.

The lowland includes Kolkhida—ancient Colchis—a potentially fertile sub-tropical region but until recently inaccessible by reason of its malarial breeding marshlands. Many thousands of acres have been drained and in the highlands from which torrents of water rush down to the Black Sea below, reservoirs have been built.

The Kolkhida lowland had been raised above river level by using

EARTH-LEVELING MACHINE USED TO PREPARE DRY STEPPELANDS FOR NEW CROPS.

FIRST WATERING OF NEW COTTON FIELDS ON COLLECTIVE FARM IN FERGHANA VALLEY, UZBEKISTAN, REVITALIZES LAND THAT HAD BEEN UNPRODUCTIVE FOR CENTURIES.

THIS GIANT EARTH MOVER FOR CANAL WORK HAS A PLOW 10 FEET WIDE, A CAPACITY OF 1,960 CUBIC YARDS PER HOUR AND DUMPS ITS LOADS NEARLY 150 FEET AWAY.

the river itself to build up land areas. At those times of the year when the Rioni and other rivers along the Black Sea coast are full of silt, their waters are channeled to swampy areas. When the dykes are opened, the water drains off and leaves a layer of silt. This process, repeated year after year, has built up heavy deposits of top soil over great areas of the Kolkhida lowland. These made lands now grow citrus fruits and tea. Malaria has been eliminated as a mass disease and modern villages, their streets lined with eucalyptus trees, now dot this prosperous land which was stagnant disease breeding swamp no longer than a generation ago. New Kolkhida is one of the richest regions of the Georgian Republic.

Great regions in the central part of Russia, on the plains of Byelorussia, Lithuania and Estonia and in the floodlands of the Volga, Dnieper and Don Rivers were pestilential swamp and bog. From the distance they gave the illusion of velvety meadows, dotted with lakes and fringed by forest. But they had the silence of abandoned and treacherous places. For some time now men and machines have been draining the swamps, dredging the muddy rivers, clearing the land, cutting drainage canals and laying underground systems.

In Polesye, a region in southern Byelorussia and northern Ukraine, especially intensive draining has been under way. This is rich land, millions of acres of it, in the basin of the Pripyat, a tributary of the Dnieper. Wheat, sugar beet, hemp, flax, vegetables, potatoes and rich fodder for livestock feeding are now grown on the drained lands.

On the Lyuban Collective Farm in Byelorussia, one example, the greater part of the plowland is reclaimed swamp and peat-bog. Once barren land, it now provides large yields. The Nakotne Collective Farm in Lithuania, another example, more than doubled its yield of cereals, sugar beet and vegetables by draining reclaimed land. So too for collective farms in Latvia and Estonia, in West Siberia, North Russia and other parts of the country.

Mechanical Diggers

The labor on these huge projects is done by machines, many of them of new design. A unique machine to grade the slopes of irrigation canals was built by Ukrainian engineers. It does the labor of more than five hundred pick-and-shovel men. Giant walking excavators of Soviet design and make are at work in the Central Asian deserts, in the steppe-lands of the Don and the Caucasus lowlands. A suction dredge that digs 35,000 cubic feet an hour floats through the desert on water for which the machine itself has cut the channel.

For the big construction jobs Soviet industry turns out forty-ton dump trucks, automatic concrete makers, grader-elevators, scrapers, multi-bucket excavators and ditchdiggers. Shrub-cutters and stump-pullers are made for work in swamp woodlands. Marsh plows will cut through eight-inch stumps without any difficulty.

New machines are designed with the peculiarities of special regions in mind. Land in the Baltic region, for example, is strewn with granite boulders, leftovers of the last ice age. These boulders complicate stump clearing and plowing. Machine operators and Estonian Academy of Sciences people, working together, designed a plow that "sees" the boulders underground and by-passes them. These plows are now fairly standard equipment in Estonia.

Nearly 90 per cent of drainage and irrigation work in the country is mechanized, with some jobs completely mechanized. As a consequence, these immense projects that fructify hundreds of millions of once desolate and unproductive acres are carried through with almost incredible speed to change the face of the land. ■

DRAINAGE TILE IS BEING LAID UNDERGROUND IN SWAMPY LITHUANIAN FIELDS.

FINE QUALITY GEORGIAN TEA IS BEING HARVESTED ON FORMER SWAMPLAND.

PREPARING SOIL WITH TRACTORS IN A DRAINED SWAMP AREA IN BYELORUSSIA.

Soviet Union Pavilion Set for Brussels Fair

An artist's sketch of the USSR Pavilion for the Brussels Fair. Theater at the left seats 1,000.

By **Alexander Nikiforov,** Director, Soviet Exhibit

THE SOVIET UNION has accepted an invitation to participate in the World Fair to open in Brussels on April 17, 1958. The fifty-odd countries participating in this first postwar fair will exhibit a rounded picture of the momentous scientific, technological and cultural achievements of today and the promise they offer for a richer and more peaceful tomorrow. This is the grand theme of the Fair, one which the Soviet Union endorses most heartily.

In the twenty years since the Paris World Fair of 1937 and the New York World Fair in 1939—the USSR participated in both—Soviet growth in industry has been paralleled by growth in science, education, culture—in every aspect of human endeavor. The overall growth may be judged by the Soviet Union's share of present world industrial production—twenty per cent.

The USSR Pavilion

The Soviet Union will have its own pavilion at the Brussels Fair—it has already been designed—and will have additional exhibits at the various international pavilions—the "Palace of Science," the "Palace of Art," the "Atomium." It will also participate in theater, music and art festivals, the sport competitions and the scientific congresses.

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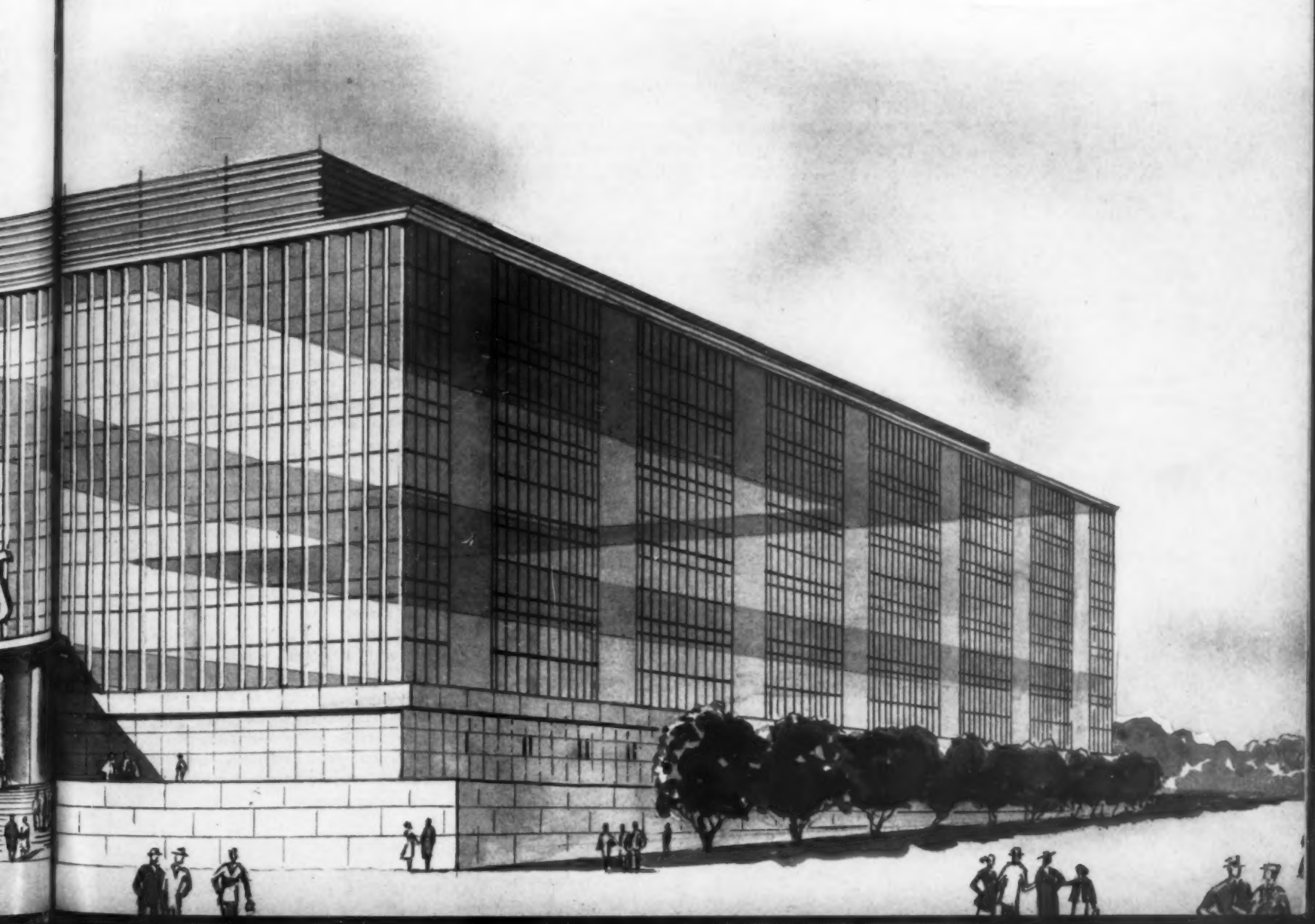
Director Alexander Nikiforov (left) discusses plans for the fair with Artist Boris Rodionov, while they carefully examine one of the many minutely designed scale models of a portion of the large Soviet exhibit.



Soviet Union Pavilion Set for Brussels Fair *Continued*

The Soviet pavilion is to be 490 feet long. 230 feet wide and 72 feet high, with floor space of 230,000 square feet. The open-air exhibit area will provide another 20,000 square feet. The pavilion will be shaded by silver firs, birches and other trees native to the country's forests.

It will be built largely of glass with polished aluminum girders and decorative columns, and designed in permanent units that can be taken apart, a novel feature from the architectural and engineering point of view.

A wide stairway will lead into the spacious first hall of the pavilion which will picture the social and political character of the Soviet Union. The guiding theme here will be peace and international cooperation through cultural exchange and international trade.

The next hall, the largest, will display the raw material resources of the country and its heavy industry. The many hundreds of varied exhibits will show how the great coal and metal bases were organized in the Urals, Siberia, Kazakhstan and other parts of the country; the exploitation of the new oil regions in the east, and the building of the newer industries—aviation, machine tools, automobile. Exhibits will show the progress of automation and the ways by which it has reduced working hours and raised living standards. This hall will also show developments in power engineering, telemechanics, electronics and the peaceful uses of atomic energy.

In an open area near the pavilion there will be a demonstration of an oil well drilling with turbodrills and electric drills of the most modern design. Licenses to make certain of these new drills have been sold by the Soviet Union to the United States and the German Federal Republic.

Here too will be demonstrated how the young miner Nikolai Tikhonov sank a mine shaft at the unprecedented rate of 790.8 feet per month in 1957 at a Ukraine mine, a feat which was subsequently duplicated elsewhere. In the Tula coal basin a team led by Nikolai Semyonov tunneled 4,280 feet of drift in one month.

A model will demonstrate descent into a mine to show the use of coal combines and safety devices. The entire cycle of coal extraction by machines and mechanisms, from hewing to loading, will be shown.

The agricultural displays will show the radical changes in farm operation—the great increase in sown acreage, the cultivation of virgin soil, the new irrigation and drainage developments that have provided larger crop yields and altered farm life.

Exhibits of consumer products and of food industries—textile, shoe, fur, clothing, meat and dairy, wine, vitamins—will display the progress in these areas. Panoramas, models and photographs will show visitors Soviet resorts, sports, and other leisure time activities.

Educational and cultural progress in the Soviet Union will be pictured with displays of industrial and scientific training and teaching of the humanities.

A special exhibit will show scientific research work, the ties of the Academy of Sciences with industry, and the major achievements of Soviet science and engineering in energetics, automation, telemechanics, and industrial processes.

A large display will be devoted to literature and art. Fair visitors will see Soviet ballet, opera, drama, circus, and puppet theaters. Works of Soviet composers will be played.

An exhibit will show how new villages and towns are born and old ones rebuilt and modernized. Another will demonstrate socialized medicine in practice, its emphasis on prevention and the sharp reduction in the mortality rate and the increase in longevity which results.

The final display in the pavilion will have the theme "Visit the Soviet Union" with appropriate material on touring.

Adjacent to the pavilion will be a movie theater and concert hall to accommodate 1,000 and a large restaurant which will serve national foods and wines.

Besides the displays in the Soviet pavilion proper, there will be additional exhibits in the international pavilions.

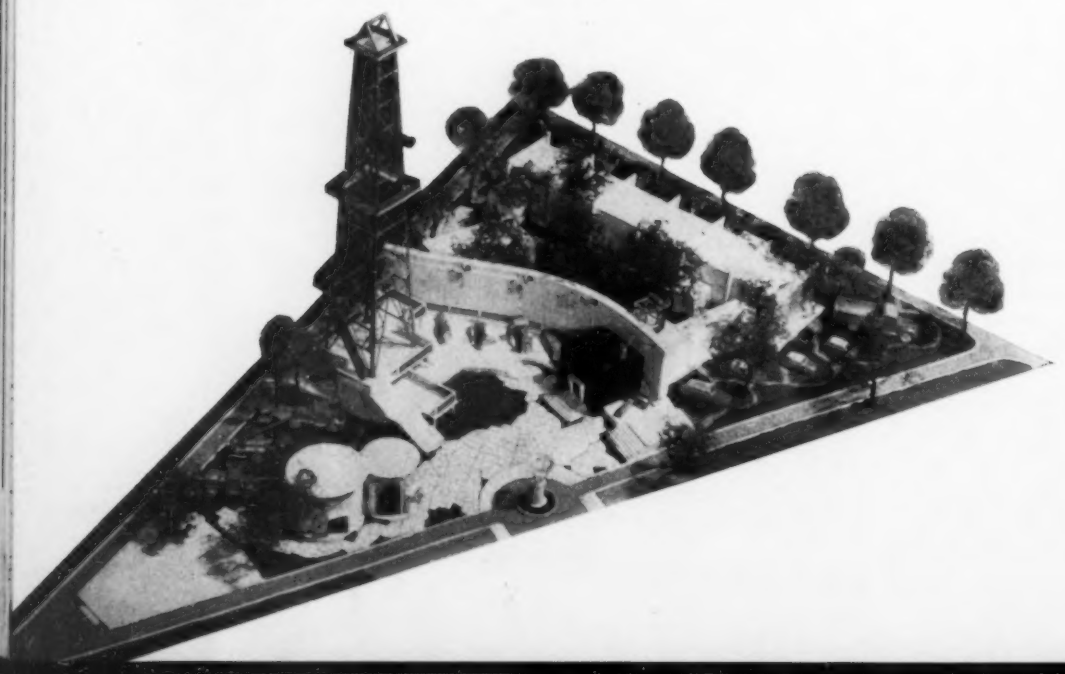
In the "Palace of Science," Soviet scientists will demonstrate the results of their research in twenty of the most important current scientific problems, among them studies in chain reactions, thermonuclear reactions and the physical properties of substances. The work of Nikolai Semenov, Nobel Prize winner, in chain reactions will be demonstrated, as well as that of Alexander Nesmeyanov in organic chemistry, of Alexander Vinogradov in geochemistry and of Andrei Kursanov in biology.

Soviet painting and sculpture of the 20th century will be on exhibit at the "Palace of Arts" from April until the end of July. For August a new show will be mounted around the theme "Man and Art."

In the "Atomium" Pavilion, the USSR will occupy one of the nine booths. Here Soviet physicists will demonstrate the solution of important technical problems in connection with the peaceful uses of atomic energy. Developments in industrial atomics, and the world's first atomic power station will be featured in the exhibit.

The Soviet Union has been assigned three "Days of Nations"—August 11th, 12th and 13th—for presentation of radio and telebroadcasts, films, concerts, dramatics and sport shows. The guiding theme here, as in all other of its exhibits and shows at this World Fair, will be the related nature of all art and knowledge, the need for greater mutual understanding among peoples. ■

This table model shows the grounds near pavilion where Soviet turbodrills will be demonstrated.



THE TU-114, A FOUR-ENGINED TURBOPROP, CAN FLY NON-STOP FROM MOSCOW TO NEW YORK IN 10-12 HOURS.

More New AIRCRAFT

SOVIET aircraft designers have kept world aviation buzzing with speculation about what they'll come up with next. This time they have a turboprop commercial airliner and a helicopter that's a veritable flying boxcar.

TU-114 Airliner

The sleek turboprop called the TU-114 was produced by the designing office of Andrei Tupolev. This same office was responsible for the two-engined TU-104 turbojet, its modified version, the TU-104A, and the TU-110, a four-engined turbojet, all three of which created such a stir in aviation circles.

In setting about to produce the TU-114, the designers sought to build an airliner with greater speed, increased carrying capacity and an even longer range of flight than the three previous creations. It was also directed to make the new plane's operating costs so low that air travel would be no costlier than first-class rail tickets without considering the obviously important savings in time and convenience.

The TU-114 meets the specifications outlined. It is a passenger ship powered by four smooth turboprop engines, and will carry passengers, mail and freight on intermediate and long-distance flights at speeds to make all present timetables obsolete.

On its intermediate flights the plane might operate from such points as Moscow to the Crimea or the equally famed vacation resorts of the Caucasian region. For long distance runs one might expect to find it operating between the Soviet capital and such points as New Delhi, Vladivostok, Peking, or perhaps have its manifest list the destination as Washington or New York.

The TU-114 will be able to take off from Moscow, fly over most of Europe, race across the North Atlantic and swoop down on a runway in the New York area in a matter of from ten to twelve hours non-stop.

This performance coupled with the exceptional capacity, convenience and comfort of the new ship will make it a very popular aircraft.

Completely pressurized cabins assure maximum comfort for all aboard even at its cruising altitudes of 30,000 to 40,000 feet. All cabins are air-conditioned.

The TU-114 is a multi-purpose craft with versatile characteristics. It can be utilized for at least three commercial purposes:

1) As an intermediate distance airliner it can transport 170 paying passengers with all the conveniences and facilities demanded by today's travelers.

2) As a long-distance cruiser it may be modified to carry 120, with the additional space devoted to de luxe facilities required for lengthier hauls.

3) As a carrier for relatively short-range journeys, the TU-114 can be set up to handle 220 passengers with even greater economies and still retain its unmatched speed and other features.

Suppose we take a quick glance at the TU-114 as set up for 170 passengers. Forward is the usual pilot's compartment with adequate space for all crew members. Back of this is a cabin for 41 passengers. The comfortably upholstered seats are arranged three abreast on each side of the center aisle.

Next comes a section arranged in the same manner but with every other row facing the rear and tables installed between each set of seats. This is the restaurant and here passengers may relax while dining on piping hot food sent from the two-chef kitchen on the ship's lower deck by twin electric elevators.

To the rear of the diner comes another passenger section for 54 persons, and back of it are four cabins. Each of the cabins is provided with seating for four in daylight flights and may be converted into full berths to sleep three at night. Another compartment for three persons is situated in the extreme aft of the plane. The lower deck holds freight and luggage and the kitchen.

The ship is manned by a crew of eight: two pilots, navigator, engineer, radio officer and three stewardesses on ordinary runs.

MI-6 Helicopter

The world's most powerful helicopter has recently made its bow as the latest aviation creation from the designing office of Mikhail Mil.

The plane is the MI-6, and its mammoth body easily accommodates whole bulldozers and huge tractors. It would even have room for two average size passenger cars or three of the smaller versions. All could be put aboard under their own power through the use of the helicopter's folding ramp.

Designed to carry some 70 to 80 passengers, the MI-6 was test flown with a payload of more than 24,000 pounds and easily lifted this cargo to the world record height of 7,874 feet.

The MI-6 has two turboprop engines and its main propeller has five blades. It will be used to deliver freight and supplies of all sorts to remote villages, to prospectors in the tundra and distant steppe areas, to explorers and scientists in the frozen arctic, or to construction sites far beyond established highways.

One of the special safety features of the helicopter is its ability to continue in flight with only one motor in operation. Another is its characteristic of being able to glide to a landing without any power whatever as the "whirly-bird's" great propellers ease it to the ground. ■

THIS GIANT OF A HELICOPTER EASILY LIFTED A PAYLOAD OF 24,000 POUNDS TO A HEIGHT OF 7,874 FEET.

Sergei EISENSTEIN:

Talented Movie-Maker

The cinema has produced many directors with great talent, but Sergei Eisenstein was one of the most daringly creative, one of the most wide-ranging of the world's movie-makers.

He served in the Red Army in 1918. In the early twenties he worked in the theater and in mass pageants and then moved into motion pictures. With the distinguished cameraman Eduard Tissé, he made the great silent films, *The Battleship Potemkin* (1925), and *Ten Days that Shook the World* (1928). Among his sound films were the memorable *Thunder over Mexico* (1932), *Alexander Nevsky* (1938), and *Ivan the Terrible* (1944-6). The death of Eisenstein in February 1948, at the age of 50, was an irreparable loss for Soviet films and for world art.

Grigori Kozintsev, Soviet film director, sketches a portrait of Sergei Eisenstein, his friend.

By Grigori Kozintsev

PAINTED on his ceiling are concentric circles in black and bright orange, like oversized targets in a shooting gallery. Why decorations on a ceiling? Why not? They startle but compel the eye, are strangely suited to the room and its owner, Sergei Eisenstein. He is a very young man still, twenty-two or three, so little known that he is not even "promising" yet, as they say in art circles. He strides restlessly about the room, his shock of hair standing on end above a bulging forehead, talking about his plans in a curiously cracking voice.

He walks over to a corner and lifts the cover of a huge chest. Such chests, bound with strap iron and trimmed with worn leather, are familiar furniture in Russian homes at the turn of the century.

But this chest does not store the usual fur cloaks and coats besprinkled with camphor. It is crammed with papers from top to bottom—color sketches, notes on torn copybook pages, clipped magazine articles heavily underlined in black pencil.

These are production projects. Schemes by the trunkload. They all have to do with the theater—direction, stage sets, working scripts, costume designs.

Squatting on the floor, Eisenstein talks of his plans, his ideas for the theater. Incredible ideas. For the production of a George Bernard Shaw play he wants to build a moving escalator in the center of the stage, like those in department stores, and at right and left stage, elevators in which the characters keep moving up and down during the dialogue.

And—pulling out another sketch—this character from a Jack London story, the hero, would be shaped like a cube; this one, the villain, like a ball, everything about him ball-shaped, his head, his nose, his body.

Papers in the hundreds pulled out of the chest—the vivid color, the plastic line of the drawing runs on in a rush of multiform impressions. Drafts—not yet worked up, but brilliantly inventive—insistently demanding to be brought to life on the stage.

A chest packed full of imagination, of fancy, of passion, straining at the worn-out sides until it seems as though the iron straps will give way, snap off.

An overfull chest of magic projections at a time when Eisenstein's artistic life had barely started. When he died ten years ago, the chest was still full, still brimming over. Only a few of these many projects left that magic chest before his life ended. There were such an infinity of things he wanted to do.

But what he did manage to get done was enough to fill a glowing chapter, not in the history of the motion picture alone, but in the history of our contemporary culture.

He was less than fifty when he died. And while the number of pictures he made was not great, his discoveries and original techniques have enriched the medium enormously.

SERGEI EISENSTEIN VISITED THE USA IN THE EARLY THIRTIES. THIS PICTURE WAS TAKEN IN NEW YORK.

A Universal Curiosity

Life is reflected in the work of every artist, but it is not a mirror image. The character of the work depends on the reflecting surface, the make-up of the artist.

Eisenstein was an erudite man, one of the rare people whose range of interest and knowledge embraces the whole world. He spoke several languages and lectured in the universities of many countries.

What was more—he was a unique individual. Singular. That was patent in everything about him, his work, the way he spoke, even the way his house was furnished. The moment you came into a room he lived in, there was no mistaking it as Eisenstein's. Everything carried his imprint. Everywhere, right from the entrance hall, books lay piled, on shelves in a double row, on tables, chairs, everywhere they could be stacked. Books on philosophy, painting, psychology, the theory of humor, history of photography, the circus, cartoons—to list the subject headings alone would make a fair-sized article.

His intellectual curiosity and wide knowledge were mixed in with a passion he had for funny invention, a kind of game which he had been playing ever since childhood. Lamp shades made of wicker baskets hung to cast weird shadows on the wall. A globe cut in half mounted in a huge gold rococo frame. A plaster cast of Pushkin jostles a delicate antique figurine from the Chinese theater. A lithograph by Daumier is neighbor to an old Russian wood carving.

His eyes were wide open to everything. Whether it was Marx or Pushkin or Chinese art or the Novgorod school of architecture, it was none of it academic study. He related it to art, he integrated its pertinent elements into his motion pictures.

He studied Japanese ideographs, analyzed Pushkin's visual imagery, searched the paintings of Surikov and El Greco, looked on at experimentation in physiological laboratories, made friends with people in all walks of life—a living-learning process, all-inclusive.

His art was not frozen, stylized. It was fluid. He rejected old forms, not because he was straining for originality but because he was searching for those new forms that would best express the new content.

He had no use for "star" pictures or pointless spectaculars. He dreamed of screenplays with history as the author and a nation's ships, guns, city streets, the sea and wind as the cast.

He showed that a film could have a larger theme than romance. It could be the struggle of peoples for justice, reflected in the simplest details—a baby carriage rolling down a great Odessa staircase, released from the hand of the child's mother who had just been killed; a pair of broken pince-nez; a candle in the hand of a dead sailor—details that became momentous, universal, unforgettably engraved in the eye and memory of the viewer as *Ten Days that Shook the World*.

His cruiser *Potemkin* steamed full speed across all frontiers, its engines pounding out the beat of the Revolution louder than the cries of the censors. It was a tall mast that flew the mutinying sailor's hand-painted flag high enough for the whole world to see.

THE VERSATILE DIRECTOR (LEFT) WITH AMERICAN PRODUCER JOSEF VON STERNBERG AND MARLENE DIETRICH.

Screening History

Nikolai Gogol once wrote: "There is the stage and the stage—two different stages calling forth two different kinds of enthusiasms from audiences. There is the enthusiasm evoked by a dancer who can kick higher and there is the enthusiasm evoked by a great actor who stuns an audience with an inspired reading."

Eisenstein gave great readings. He made it evident that there were motion pictures and motion pictures. It is one thing for a clever craftsman to amuse an audience for an evening with painted scenes of spurious happenings and sham relations; it is quite another to bring a transfiguring period in history to the screen with all its tragic and comic humanity.

Eisenstein strove not to amuse but to stun. He carried the motion picture toward a new dimension, from the slapstick comedy of pie-throwing and the tear-jerking sentimentality of imperilled innocence, to the "stunning" epic. It was a dimension the stage had lost centuries ago.

Once more—but now in a new quality—Eisenstein dramatized tragedy and horror, compassion and hate, a whole constellation of emotions. Crowds numbered in thousands were themselves the characters in great scenes: the hero was the crowd, not typified by and reduced to one character.

It was not that Eisenstein thought up a new genre. It was life itself that demanded the new forms, the millions who were chopping the new broad highway of history. These great human struggles needed to be reflected in art. It was Eisenstein who found the ways.

He worked like a mural painter, transforming speech, poetry, music, into large plastic forms. He was not attracted to complexities of psychology or subtleties of speech. He searched for the visual. His screen was a gigantic fresco, alive and seething with detail. Everything became palpable, tangible. It had weight and body and substance. It could be seen and touched—the storming of the Winter Palace, the battle with the knights on frozen Lake Chudskoye, the religious procession through heavy snow to meet Ivan the Terrible—all had the poetic detail of great reality.

These were not merely expertly directed scenes. They were discoveries in aesthetics. Again and again in films made in every country in the world, we see Eisenstein's pioneering touch in the reality of the unmade-up faces and the monumental plasticity of the landscape scenes.

A few months ago I saw Cinerama in a Paris motion-picture house. I thought of the technical genius behind this new camera development, and then of the use being made of it. Couldn't more be done with it—with this widened screen and this great diapason of sound—I wondered, than to use it to show Switzerland as winter sport country and France as the home of the can-can?

And then I thought of Eisenstein.

How much wider than Cinerama was the world on his screens. How much more eloquently than the stereosound did his silent pictures speak. How much more vivid than color pictures was his black and white art.

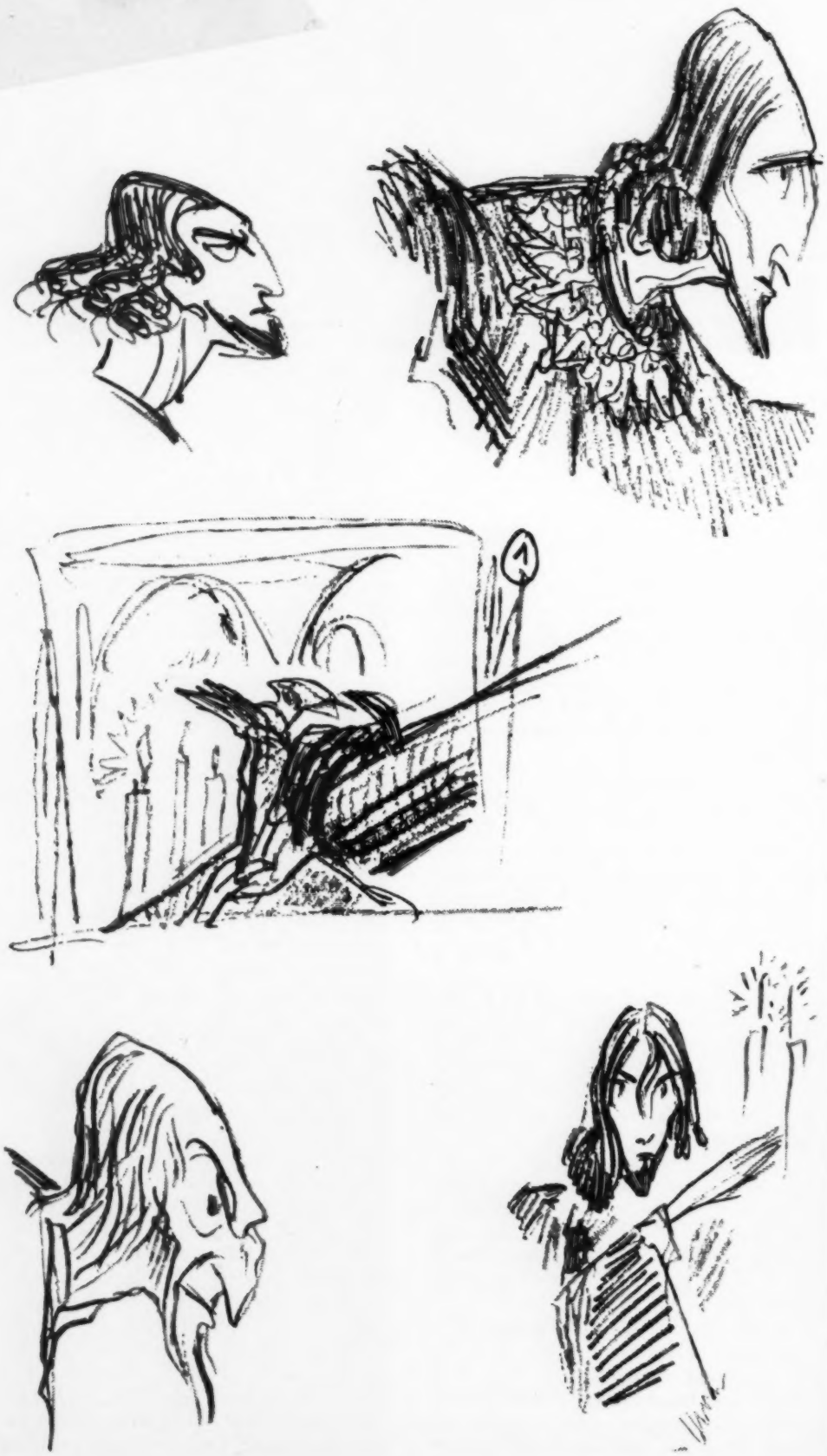
He died ten years ago, but he is still a living and pulsating force in world motion picture art. ■

Sergei Eisenstein's Sketches for His Film *Ivan the Terrible*

Sergei Eisenstein's personal files hold hundreds of drawings, rough drafts and sketches that help us understand how the high imitative art of his films was created.

His drawings for *Ivan the Terrible*, which are reproduced here, are rough sketches or "visual shorthand notes," as he termed them. In working on the scenario and preparing for shooting, Eisenstein clearly saw all the details to make up the graphic interpretation he desired: composition, light, costume texture, decorations and make-up.

The first four drawings depict his search for the right external appearance of Ivan, and show the make-up of Nikolai Cherkasov in that role, while the right bottom drawing shows Ivan over the corpse of Anastasia.



Daguerreotypes

A Personal Impression of America

By Sergei Eisenstein

RETAINED in my memory are countless impressions of first meetings.

The first meeting with George Bernard Shaw.

The first skyscraper.

The first meeting with Mack Sennett and Gordon Craig.

The first ride in a subway (Paris, 1906).

The first meeting with Jean Harlow, queen of the platinum blondes, in a setting of peacocks on a marble parapet ringing the blue water of the swimming pool at the Ambassador Hotel in Hollywood.

The widow of the great writer Dostoyevsky —Anna Grigoryevna Dostoyevskaya. For this meeting I, then still a boy, specially read *The Brothers Karamazov*, so that I might have something to talk about with the great widow. But the talk did not materialize—it was just a meeting and nothing more. I gave up the conversation for a big chunk of blueberry pie. which I picked off the table, and a game of tennis.

My first meeting with a movie star on American soil. That was Rin Tin Tin, the first star I met and with whom I was photographed. It was in Boston, where he and I made personal appearances in neighboring movie houses, each before his own picture.

I even remember my first movie fairly distinctly. That was in Paris in 1906.

These first meetings, each in its own way, were marked by a keenness.

And one of the keenest first meetings for its impressions was my meeting up with the works of Daguerre in America.

DAGUERREOTYPE FROM EISENSTEIN'S COLLECTION.

I don't know whether I had never come across them before, or had paid no attention to them, or because, being captivated with "left photography," I simply had never noticed them.

I was to make a film of the story of Captain Sutter, on whose land gold was first found in California. Like many other picture projects, this one did not materialize. However, because of it I traveled over a good bit of California. I saw Fort Sutter, and Sacramento, the capital of California.

In the offices of some big firm in San Francisco—I no longer remember what they manufactured—I was shown a relic, a saw from Sutter's sawmill, where the first gold dust was found.

In some out-of-the-way small towns in California, I visited nearsighted little old ladies who still remembered "The Captain" putting them on his knees—a horseman's powerful knees, he had—and bobbing them up and down.

Gradually out of the fragments of impressions and survivals of traditions (in Sacramento, for instance, beard-growing contests are still in vogue: the contestants shave on one and the same day and hour, and after the lapse of a specified time they measure the hirsute crop on their chins to determine the winner), from the appearance and customs of people, I came to feel the atmosphere of the America of the forty-niners, the America of the gold rush days, of the pre-Civil War period. An America already of necessity facing a range of problems for some of which the Lincoln epoch was to provide the solution while other new ones were to arise.

Following in the tracks of the colorful Captain brought us to the porch of a small house. It was the local museum. I no longer remember the name of the town. The museum was a modest one.

Affectionately surrounding the two or three genuine relics of the Sutter period—some odd buttons, the brim of a felt hat, and, I believe spurs—were whatever else they had found dating back to those years. Beaded bags, candlesticks, cracked cups, embroidered little pictures, hearth tongs and sugar tongs. And two or three small showcases. And in them a revelation.

Daguerreotypes—which I saw and held up for the first time. *Continued on next page*

WITH CARL LAEMMLE, PRESIDENT OF UNIVERSAL.

Sergei Eisenstein's Sketches for His Film *Ivan the Terrible*

Eisenstein said: "The composition of any scene should always be resolved from a piece which is most striking in its content and originality. Here, it should be borne in mind that the greatest impression is usually conveyed by a piece which is not only spontaneously effective but which contains the internal dynamic expression of the theme."

The sketch at the top shows the vow over Anastasia's coffin, while alongside is Eisenstein's idea for the make-up of Vsevolod Pudovkin in the role of Pimen.

"I think the nature and surroundings and decorations at the moment of shooting, and also the filmed material at the moment of editing are often cleverer than the author or director. It is a great blessing and a great art to be able to hear and understand the promptings of nature or of unforeseen points in the decorations you have conceived . . ."

The sketch above depicts the procession of the cross while below is the actual still from the film.

Daguerreotypes

Continued

Small, often almost black, dating back to the period zinc was used; or with a smooth and mischievously winking surface. Only by turning the glass surface in a particular way could you see the images in the small folding boxes, inside of which they are edged with a thin crimped frame made of copper plates as thin as foil.

A slice of a living image, a living slice of the period, a model of the living national character inside.

Very likely it was the amount of reading I had done, or the countless stories I had heard, or my complete absorption in those by-gone California days that made these ancestors of modern photography suddenly reach toward me from under the dusty glass of the showcase.

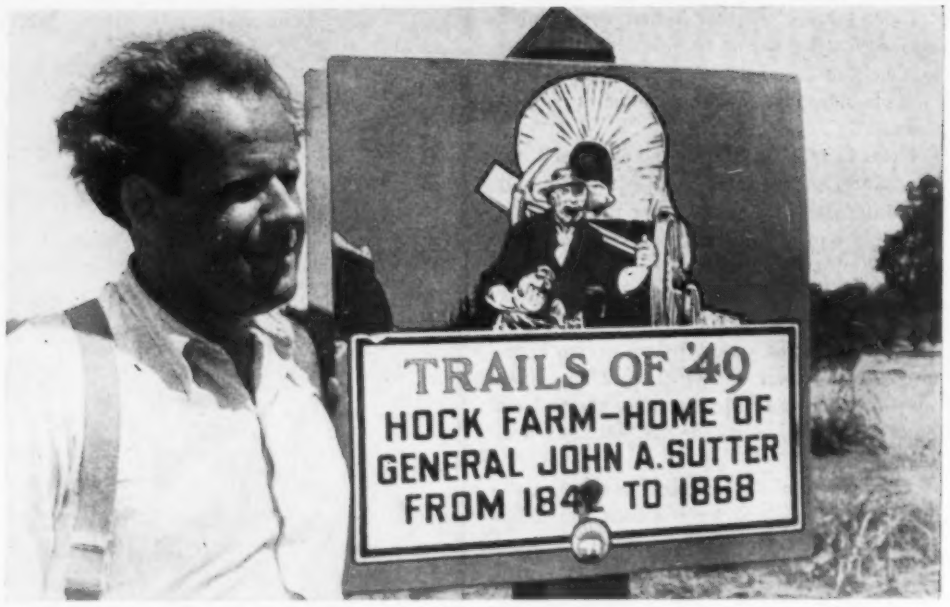
The past—another world, another century—looks at you with living eyes from the hinged leaves of these daguerreotypes. On one leaf is a slightly worn and faded orange-, cherry-, or chocolate-colored little velvet cushion, and looking at you from the other leaf are eyes surrounded by Confederate kepis and the "Uncle Sam" beards of the numberless and mostly anonymous, but once famous and distinguished first people of their little towns, the lively, busy and businesslike Americans of the forties, fifties and sixties.

Here they are. Their wives. Their children. Young people who had come from far-away places to the first American towns. Here you see them at the outset of their careers.

For the first time, a watch-chain across a bright vest. A rather stiff pose. The neck a bit too rectilineal, sticking out of a very low open-cut collar.

An enormous intricate knot in the tie which seems to match the enormous knotty hands. In the bends of the fingers you can still read the compass of the plow handles before the fingers became accustomed to draw, not a penholder yet, but a quill pen over the business letters, cash books of banks, judges' court records and lawyers' documents.

Here you see them at the height of prosperity. The lines of the watch chain follow the fold across the dazzling vests.



PLANNING A GOLD RUSH FILM, EISENSTEIN VISITED THE LOCALE WHERE THE GOLD WAS FIRST DISCOVERED.

Chatting on General Sutter's farm with one of the old-timers who still remembers the general.

And there is something servile about the stiff plush armchair trying to accommodate its inherently inconvenient arms to provide maximum comfort for the arms of Mr. So-and-So, who has won prosperity, recognition and universal respect.

The surface of another daguerreotype, an earlier one, plays like the reflection in the mirror of a laryngologist. In the glitter of its surface you detect the fleeting outline of pale cheeks and the fluffy variety of checkered silks in which the wives and mothers of the prosperous gentlemen decked themselves out. The elegant white crimped caps, encompassing like helmets the no-less-intricately crimped curls of the hair-do.

The clever method used by Daguerre and Niels gradually squeezed out the earlier American painter who traveled from townlet to townlet and from farm to farm to paint family portraits. He carried with him already-made small pictures of painted-in figures in lace caps, black silk dresses drawn in tight at the waist and carefully draped shawls—all without faces. The portraits were filled in from life, with the face of the person who ordered the picture.

And my oh my, what a diversity of faces, what vital traces of biographies in the wrinkled faces, double chins, creases around the eyes and triumphantly turned-up noses of the successful people, or the sad youthful faces from under their Confederate kepis, looking as though waiting for their approaching end in hospitals, so touchingly described in the notes or diaries of Walt Whitman, the "great gray poet," who helped to brighten the last moments of so many of them.

From that day on began my eager, roving, dogged chasing to the little stores run by junk dealers; stores where odd things are sold, and tiny antique shops, of which there are so many advertised by fanciful bent metal signs on the road from Los Angeles to Santa Monica or Pasadena.

And here I discovered, to my great dismay, that the photographs of the past which fascinated me were not quoted at collectors' prices. It was the cases. The specimens in the slightest degree passable—specimens many times better than the fortuitous collection in the small museum—were very often outrageously expensive.

I discovered that devotees were collecting not the pictures, but the cases in which they were carried, just as now young Americans will carry a picture of mom and pop in a wallet, and after a certain age, pictures of the wife and kids.

Among these cases there were really very interesting ones, made not only of stamped leather, but also of mastics resembling carved stone.

Be it as it may, the devil take the cases! What captivates me is the slice of the living spirit of old America, like a fabulous jinni caught alive and held within the leaves of the case.

A few old American "jinn" of this kind I lovingly keep deep inside my bookcases. Sometimes I take them out. I wipe off the dust. And then, for a while, I see before me pictures of the earlier America.

These miraculous glass and zinc plates made me wish to recreate the amazingly colorful America of the past, its towns which sprang up in the halting places of buffalo, in places where Indian wigwams once stood; around little missionary churches; scattered amid the expanses of virgin forests and prairies; or on the foundation of vessels which, after mooring at the small St. Francis mission, cast anchor for good in the hospitable bay. Emigrants filled the ship with sand from port side to starboard, erected cabins on the decks, and these became the first houses of the future San Francisco.

The cover of the little case is closed. The invariable hook is snapped. The desk drawer or the door of the cupboard in which it is kept is slammed. And for many months the memories fade, until I look at the daguerreotypes once again to envision Captain Sutter and the America he lived in. ■

Ski trails in a park lure hikers by thousands. An occasional spill simply adds to a day's fun.

College students forget the classroom when they take dates to the rink for a few carefree hours.

No one delights in snow more than the kiddies. They find the gentle slope ideal for sledding.

Favorite Winter Sports

This small boy soon learns that he reaps what he sows and also something of cause and effect.

In colorful, spangled costumes, this amateur troupe of fancy skaters shows its patterned and practiced skills before a solid-packed audience on a flooded soccer field. The children start training very early.

A bus-load of hunters off to the fields before dawn characteristically swap tales about dogs.

For the more skilled no thrill can match this. A lightning-swift descent and then you're off!

Father teaches his figure-skating daughter how to sharpen the blades just so for quick stops.

Big league hockey creates intense partisans as crack teams meet in a stadium during cup play.

Motorcycling is exciting enough normally, but races run over snowy courses add more thrills.

A brisk afternoon brings out crowds of skaters to park rinks where oldsters join the novices.

Who's Who in Speed Skating

By Victor Kuprianov

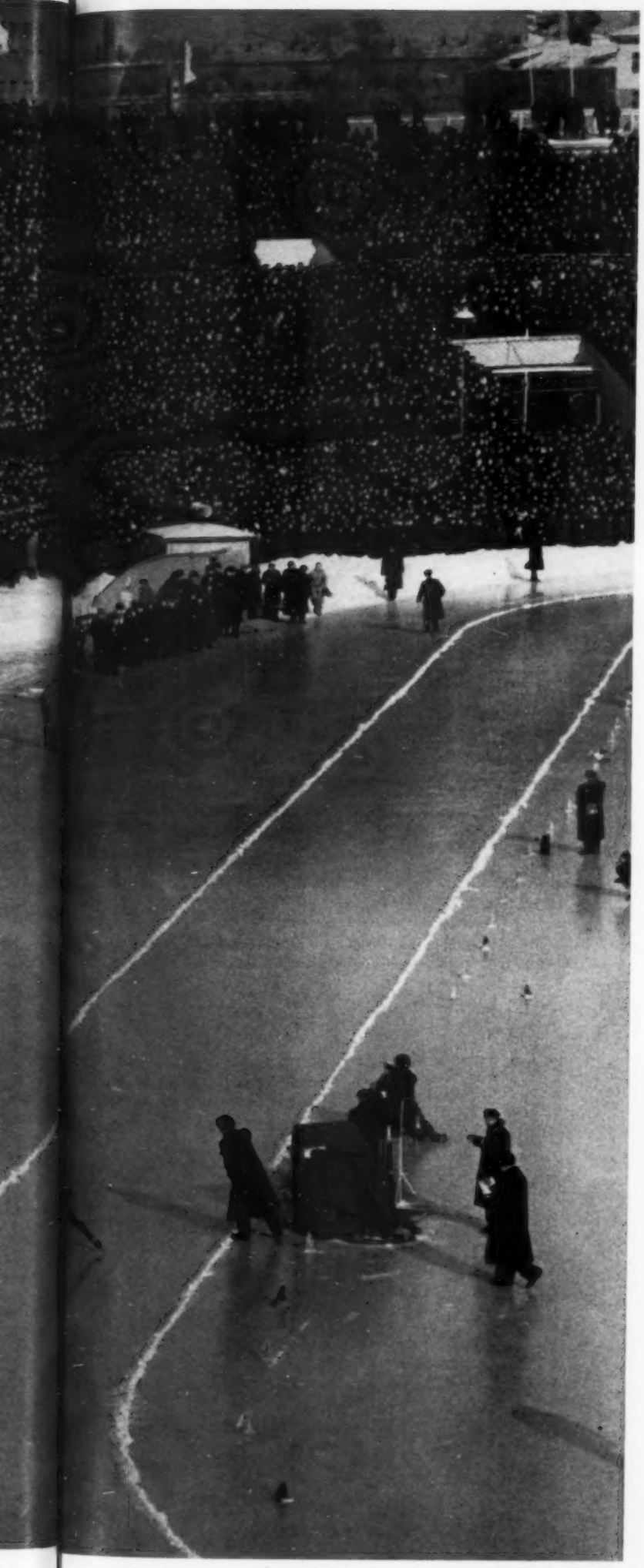
FORECASTING in sports is as risky as forecasting the weather. This is not an attempt to name the winners at the coming world championships—we would just like you to meet some of our leading skaters.

First on our list is Oleg Goncharenko, once known as the skating fireman. Whenever fans see him nowadays they always point a finger and say: "There goes the *ex*-champ." Whenever he's introduced, the host or hostess usually says: "I'd like you to meet the *ex*-champ."

Goncharenko is so tired of this "*ex*-champ" business that he's decided to get rid of it. Well, he will have his chance at the world championship in Helsinki this month. Meanwhile—some facts from his sports biography.

Oleg Goncharenko is one of the lucky ones who can truly say: "All that I am I owe to my mother." It was his mother who got him interested in speed skating and was even his first coach. She herself was a skater of no mean merit.

Oleg Goncharenko is 26—but already has 12 years of skating behind him. He zoomed to fame in 1953 when he won the world crown. He



IN A MOSCOW STADIUM ONE CAN SEE THE IMMENSE POPULARITY OF THIS SPORT.

repeated the feat three years later and was expected to win the crown again, but illness spoiled everything. He still is one of the world's strongest skaters, however, and is determined to prove it in Helsinki. What is more, he has the satisfaction of the highest point rating for the four Olympic distances on conventional rinks.

Becoming a world champion is hard enough, but it is even more so in speed skating. The aspirant to the title here must race against time in four events: 500, 1,500, 5,000 and 10,000 meters. And it isn't the number of first places that counts. Each skater is given a point rating in which the 500-meter event is taken as the unit. So that the 5,000 would net him ten times more points and the 10,000 twenty times more. What this means is that the sprinters who run away with top honors in the shorter events never attain the world crown because they're outpointed in the longer distances.

Goncharenko has the advantage that he's much better in the longer events than in the sprints. But still, it does help to win in the sprints and Oleg is working hard to improve his sprinting techniques. This is attained by all-year training. In the summer he goes roller skating, cross-country running, and cycling to build up techniques and stamina. Incidentally this is typical of the Soviet training pattern which calls for all-round build-up and versatility in every sport.

We'd like to introduce Boris Shilkov next. This season he will not only go out to prove that he is not yet a "has-been" but also that a man can be world champion at the age of thirty. He won the crown in 1954, so he knows his way about.

Boris Shilkov was born in Leningrad but lived most of his life in Archangel where there is always enough ice to skate. He's an engineer by profession. Maybe it's the secret to the precision in his stride that helps him shave seconds off his time. In 1955 he set a new world record for the 5,000-meter run: 7 minutes 45.6 seconds. This is a phenomenal time. Shilkov won Olympic fame by winning the gold medal in the same event. Later at the world championship he won the 1,500-meter medal and missed the world crown for all-round performance by a mere $^3/_{10}$ of a point. In 1956 Boris Shilkov was the Soviet Union's best all-round performer. Although he lost this title in 1957, he is still confident and hopeful and does not believe that being on the far side of 30 need be a handicap.

Dmitri Sakunenko is another speed skater who is rated high in the Soviet bid for world honors. He is 28 and a technologist by profession. Dmitri is married and has a three-year-old son. Sakunenko has lived his whole life in forestland. When he was seven he turned to skates as a way of getting places quicker. But the skates were just blades tied by cord or wire to thick felt boots ("valenki," as they are known in Russian). On his eighteenth birthday (January 7, 1948), he got his first pair of racing skates, and his sports career really began. In 1954 he made the USSR team to the world championships where he placed fifth, which is an excellent debut. In the following year he astounded the world with an excellent 4-event rating at the high-altitude rink near Alma-Ata. At the individual speed skating title meet held in Sverdlovsk last year, Sakunenko became the champion of the Soviet Union.

We have spoken of the top three male performers—now about their opposite numbers among the fair sex.

In the previous issue of *USSR* we introduced Inga Artamonova who still remains the favorite. Next comes Tamara Rylova.

She lost her mother at the age of 10 and household chores did not leave her much time to play. At the age of 16 she went to work in a printshop and continued her studies at night school. She first got on skates when she was past 18 and she went about making up for lost time. In 1953 she won top honors at the world university games in Austria (Tamara is a Teachers' Training School student). In 1955 she set two world records—in the 500- and 1,000-meter events—that still stand. Her performances at world championship meets have been good, but not good enough to win. In 1955 she took the USSR title, the following year she made a strong bid for the world crown and ended up third. In 1957 she placed second. This year . . . but Inga Artamonova is hard to beat. In spite of this, 27-year-old flaxen-haired, gray-eyed Tamara Rylova has no intention of quitting.

Another name we might be reading in the headlines soon is Galina Zorina. This blonde 22-year-old housewife is proving as good a skater as she is a wife and mother. Of course, at 22 she does not have much of a sports career behind her, but still Galina's is worth telling.

Galina Zorina comes from the Siberian city of Irkutsk. She was very frail as a child and her parents enrolled her in a ballet school, hoping

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Who's Who in Speed Skating

Continued

that this would help build her up physically. By the age of 15 she had developed to such an extent that it became clear that ballet dancing was not for her. Track and field became her hobby. Galina's debut in skating was quite accidental. When her playmates suddenly appeared among the winners at city tournaments she decided she wanted to be a champion too. So she began training by herself on the QT. Two years later she won the Irkutsk crown. She sky-rocketed up after she began training with a real coach. In 1955 she already turned in some very heartening results, but at the USSR championship she only managed to place 69th! She was so heartbroken that she dropped the sport. Soon afterward she married and everyone thought her racing days were over. But after giving birth to a daughter she decided the exercise would do her good. She returned to speed skating and soon managed to place second at a seeded tournament at the high-altitude rink near Alma-Ata.

We have not seen Galina Zorina's name among the world championship winners yet, but she is only 22—and youth is a big thing in skating.

The skaters we've just introduced to you are not nursery-bred champions. When you get to know them you find they are extremely human. Their sports debut was the same as that of any boy or girl in the Soviet Union. First backyard sports, then school sports and so on up the ladder to the big time. All of this is strictly graded. Every stage comes under careful medical supervision to prevent overemphasis and there is always expert coaching. Whenever an athlete shows outstanding results and a desire to work his way up, the sport club he belongs to (or the college he attends) will provide him with an individual coach. Not everybody wants to become a champion, however. That makes no difference—facilities and opportunities are the same for all.

What happens when a champion gets old? Most of them try to keep in touch with their sport as long as possible and turn to coaching. Nearly all the once big-time performers now pass their experience down to the youngsters. Thrice-champion Maria Isakova, foremost speed skater in the past, is now a maker of champions herself.

One last remark—our champions have no secrets. They train in the open, and very often together with their main opponents, and pass on pointers to one another. This is possible because sports in the Soviet Union are a hobby and not a profession. ■

Coach Konstantin Kudryavtsev chats with Boris Shilkov and Oleg Goncharenko (back to camera). Films will be seen later for flaws in skating.

Dmitri Sakunenko competing in the 10,000-meter race in Sverdlovsk, where he won the title of 1957 all-round speed skating champion of the Soviet Union.

Boris Shilkov, Hjalmar Anderson of Norway, and Dmitri Sakunenko obviously enjoyed the Sverdlovsk races as much as the thousands of fans who came to watch them.

Oleg Goncharenko, an ex-world champion, ▶ has plans for a comeback at Helsinki.

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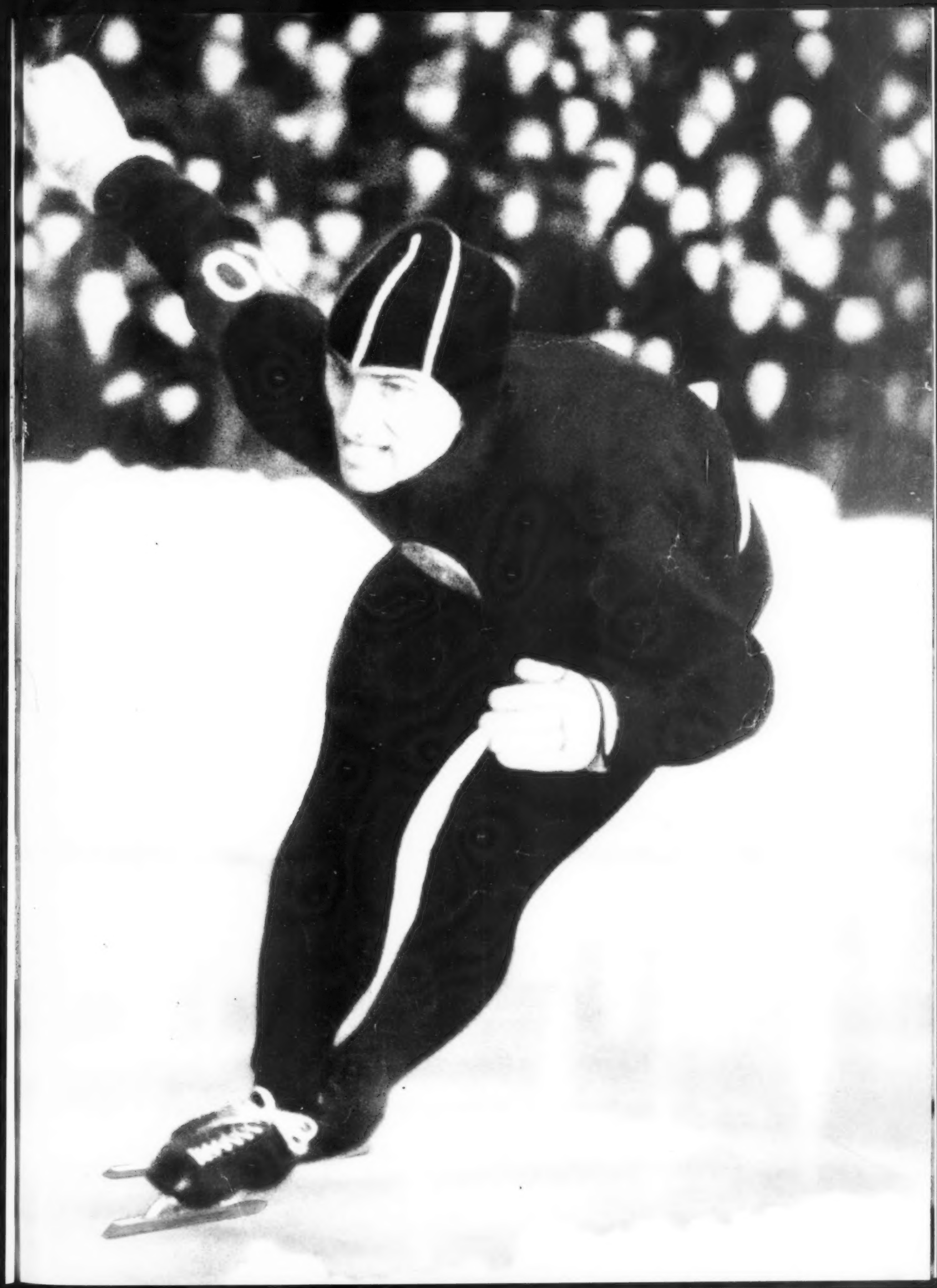

FIRST YEAR TEACHERS NINA GOLOVACHEVA AND RIMMA NIKITENKO WHO CHOSE TO WORK IN THE NEWLY CULTIVATED LANDS IN KAZAKHSTAN.