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USSR

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SCIENTIFIC RESEARCH LABORATORIES KEEP PACE WITH THE SWIFTLY GROWING NEEDS OF AN ADVANCING ECONOMY.
See Story on the USSR Academy of Sciences on Page 20.

USSR

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Front cover: When Ivan Petrov returned from military service he was warmly welcomed at the Krasnaya Roza Textile Mill in Moscow where he returned to his old job as a maintenance mechanic. See picture story "Back to Civilian Life" on page 38.

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Discussing the Future

FOR many months preceding the Twenty-First Congress of the Communist Party, the seven-year plan for economic development of the Soviet Union between 1959 and 1965 was discussed at thousands of public meetings held everywhere in the country.

Suggestions for changes and additions came from people of all ages and all vocations, from older people with experience gathered as far back as 1929 when the first of the national five-year plans was adopted, and from young workers recently out of school and on their first jobs. Discussion centered not on whether the target figures could be achieved—no one questioned that—but on ways and means of fulfilling the plan in less than the seven years allotted.

Since it is the people who will be translating these target figures into machines, power stations and consumer goods, they must participate in the planning. That is the meaning of socialist democracy—to encourage the widest possible participation of the country's people in cooperative planning and cooperative work.

Millions of Planners

In order to draw as many Soviet citizens as possible into active participation in planning and solving the country's problems, it is usual practice for the Communist Party to submit its proposals for public discussion.

In 1957 the Central Committee of the Communist Party published its draft on the reorganization of industrial management for nationwide discussion. The proposal, which aimed at a larger degree of local control of industry, was discussed by an estimated 41 million citizens. Only after this democratic expression of opinion was the draft, with amendments made by workers and technical people, considered by the USSR Supreme Soviet and drafted into law.

The same was true for the law which reorganized the machine and tractor stations and provided that agricultural machinery be sold to collective farms on favorable terms. This was adopted by the USSR Supreme Soviet in the spring of 1958 after some 50 million citizens had had their say.

It is more than probable that when the figures on the current meetings are finally tallied, the number of people who participated in discussion

of the seven-year plan in the months before the Communist Party Congress convened will have exceeded 50 million.

A Plan for a Higher Living Standard

This is hardly surprising since the new economic plan is of vital concern to every Soviet citizen, both in immediate and long-range terms. In essence, it is a plan for raising the standard of living of every worker in the country to a level far higher than the present, a level which will do more than equal the highest living standard any country has yet achieved.

During these seven years industrial production is to rise by 80 per cent, a tremendous climb. Some basic industries will show an even faster rate of growth. Gas output will increase fivefold, chemical production will treble, and the amount of oil, electric power, steel, machinery, meat, sugar and silk fabrics produced will double.

By 1965 the Soviet Union's per capita industrial output will be higher than the present level of Britain and West Germany, the two most highly industrialized countries in Europe. In a number of basic industrial items production will surpass the present level of the United States, in others it will come very close. In per capita output of basic farm products the Soviet Union will outstrip the United States.

Considering what this will mean to every Soviet citizen in terms of everyday needs—an abundance of consumer goods at lower prices, fifteen million new apartments in urban areas and seven million more houses in rural communities, more schools, hospitals, theaters in every part of the country—the interest with which the plan has been discussed is easy enough to understand.

Down to Earth Discussion

The discussion for the most part was of a practical nature and the suggestions for expediting production in many cases were applicable to a whole industry. Here was a collective exchange of ideas, of experience and of creative thinking on a nationwide scale.

At a meeting held at an engineering plant in Gorky, steelman Ivan Belyaev spoke of the possibilities of producing more steel even with

existing plant facilities. His point was that with a little imaginative thought and consideration all kinds of ideas cropped up. "We did that in our plant," he said, "and found, after we had figured out the angles, that by the end of this year we can turn out 25 per cent more steel with the same equipment we now use." These "angles" will, of course, be passed on to other plants by the State Committee on Science and Technology.

At a meeting on the seven-year plan at a rather antiquated chemical plant in the Tatar Autonomous Republic, engineer Timkin argued for complete overhaul and modernization. Supported by figures he and other men at the plant had worked up, he proved that the renovation costs would easily pay for themselves in three years. His argument had the enthusiastic support of all the workers and specialists at the plant and the funds will undoubtedly be allocated.

At a big meeting at the Riga Car-Building Plant, director Eismand reported on plans for the next seven-year period. The plant, he said, would be building 100-miles-an-hour express trains, new types of suburban electric trains and streetcars. Fitter Jaunproman raised objections. He thought the plant could more productively specialize in electric train building since there were other plants in the country which were especially geared for streetcar building. His point was supported by other people.

Fitter Jaunproman's was one of many such suggestions which are going to shape the work program of big plants for the next seven years. These suggestions came in an endless stream as the discussion proceeded. Secretary of the Moscow Communist Party organization Ustinov noted that during the first month of the discussion alone nearly 30,000 proposals were submitted by the meetings of factory and office workers in the capital.

In Every Newspaper and Magazine

The pages of all of the country's 7,500 newspapers and 3,000 magazines were open to every citizen for comments and suggestions on the draft plan presented by Nikita Khrushchev on behalf of the Communist Party's Central Committee. The Soviet public had no hesitation in expressing its reaction to the plan as a whole and to its multiple parts. Letters and articles poured into editorial offices from Communists and non-party people, industrial workers, collective farmers, students, scientists, and from people in every other field of work.

Officials of government planning bodies, party leaders, specialists in industry, agriculture, administration, technology and education—all were active participants in the pre-congress discussion. Suggestions, arising either out of a specialized background of knowledge or breadth

Newspapers and magazines received letters by the thousands from their readers with amendments suggested for the draft of the seven-year plan.



of experience ranged from a major project for a whole branch of the country's economy to an idea for improving one detail in a production process.

Here, for example, is the December 10, 1958, issue of *Pravda*, one of the two largest circulation dailies in the country, with a typical group of articles and letters from readers on the draft plan.

Komzin, a building engineer in the Volga region, suggests that a central designing office needs to be set up for the great amount of construction going on in the neighborhood of the Kuibyshev power project.

Academician Matsepura of Byelorussia proposes that scientific institutes be located as closely as possible to the production areas around which their research is centered.

Agronomist Chernov wants a larger output of bacteria preparations for farm use than proposed by the plan.

Pensioner Zeifert thinks there are not enough out-of-town homes scheduled for construction where old people without relatives can live at a small charge.

Collective farm chairman Troshin considers the target figures for farm machine production too low.

Rassokhin, secretary of the Kremenchug Communist Party organization in the Ukraine, proposes that a new economic administrative area be set up for Poltava Region and the southern part of Sumy Region in view of the plans for development of both heavy and light industries outlined by the plan for this area where large sites of gas, oil and iron ore have recently been discovered.

Almost Two Trillion Rubles

The draft of Nikita Khrushchev's report on the target figures of the seven-year plan was published two and a half months before the Congress met. A year and more of preparatory work went into the draft. Its major points were formulated as far back as the Jubilee Session of the USSR Supreme Soviet in 1957 held to commemorate the fortieth anniversary of the October Socialist Revolution.

During the whole of 1958 the outline of the plan was being developed on the basis of reports and proposals from all the republics of the Soviet Union. These, in turn, had been prepared on the basis of the more specific plans for the development of each region, city, town and village by industrial workers, collective farmers, engineers and scientists.

The plan aims at the fullest possible economic and cultural development of each of the fifteen Union Republics. The total of capital investments to be spent these next seven years for construction in various branches of the country's economy will be 1,970 billion rubles. This enormous sum is almost the equivalent of all the money spent for capital construction since the Soviet Union was founded.

How is this great sum to be spent to the best advantage? This is essentially what was discussed at these thousands of meetings.

People's Policy

Aside from the major value of democratic participation in planning, there is this additional value which the discussion had. The meetings brought to public notice a host of innovators, people with inventive ideas in every sphere of activity.

Even during the months of discussion preceding the congress the plan was beginning to take shape. After the announcement was made in October 1958 that the congress would be convened, the slogan heard in factories and farms everywhere in the country was this one: "Let's Greet the Party Congress with New Production Achievements."

Following the initiative of the Young Communist League young people joined "Teams of Communist Labor" and pledged themselves to more productive work and to harder study and self-education, as befits young citizens of a socialist society.

The discussion showed once again how close a tie there is between the Communist Party and the people. The party's proposal was the expression in the concrete of the wishes and aspirations of the country's 200 million citizens and for that reason it met with general support and approval. In discussion hundreds of thousands of people who are not members of the Communist Party spoke of the party's policy as "their own" policy.

This policy in the most direct sense is a people's policy. In these four decades which have transformed a backward country into a land of great industries, an advanced science and an educated citizenry, the party has always been guided by the concept that the people are the makers of history and that their decisions must shape the future.

MAN'S FIRST ARTIFICIAL PLANET

Placed in Orbit Around the Sun

ON JANUARY 2, 1959, the Soviet Union launched a multistage cosmic rocket in the direction of the moon. The rocket's final stage attained the speed of approximately seven miles per second necessary for interplanetary flight. In 34 hours from the blast-off, the rocket had traveled 229,906 miles and passed within 4,660 miles of the moon. Racing on in the cosmos the rocket eventually entered its final orbit around the sun.

Thus the first man-made planet was created.

The new planet's elliptic orbit, its plane roughly coinciding with that of the earth, will have an average diameter of 213.4 million miles. As a satellite of the sun, the planet will have a rotation period of 15 months. At its closest approach to the sun (on January 14) it was 91 million miles away, while its farthest departure from the sun (early in September) will be 122.5 million miles.

The last stage of the rocket without its fuel weighs about 3,244 pounds. It has a special container with a payload of scientific and measuring instruments, radio equipment and power sources. All of this totals 796 pounds.

The instruments aboard the rocket provided for detecting the moon's magnetic field and radioactivity; studies in the intensity of cosmic rays and their variations beyond the earth's magnetic field; recording of photons in cosmic radiation; determination of the distribution of heavy nuclei in cosmic radiation; studies of gas components in interplanetary matter, of corpuscular solar radiation, and of meteoric particles.

The radio equipment installed aboard the rocket included three transmitters operating on a number of frequencies and with varied beats. Throughout the period of radio contact with the new planet, all of its transmissions were successfully received by the stations that monitored them. The information relayed by the instruments on January 4 showed that the temperature on the rocket's outer shell ranged from 50 to 59 degrees Fahrenheit. The temperatures inside the rocket were reported within the same range and assured the proper functioning of all its instruments.

The rocket was equipped with a special installation which produced

a sodium cloud that made a comet-like wake or tail on January 3. The use of the light filters isolating the sodium line of the spectrum enabled astronomical observatories to photograph the artificial comet.

The cosmic rocket carries a pennant with the emblem of the Soviet Union and the inscription: "Union of Soviet Socialist Republics, January, 1959." Staffs of the research institutes, designing bureaus, the factories and testing organizations responsible for placing the new planet in orbit united in dedicating its launching to the Twenty-First Congress of the Communist Party of the Soviet Union.

Mankind's first artificial planet climaxed the outstanding achievements of the Soviet Union in science and technology. The new satellite of the sun is vivid proof of the high level of Soviet rocketry and demonstrates the rapid progress made by the country in the exploration of the cosmos started October 4, 1957, with the launching of the first sputnik.

Having inaugurated the age of space flights, Soviet scientists and engineers sought to build ever bigger and heavier sputniks with more research instruments. The successful launching of the first three sputniks furnished the preliminary material needed to carry out further space flights deeper into the cosmos.

Nikita S. Khrushchev, Chairman of the USSR Council of Ministers, commenting on the launching of the cosmic rocket, said that it had blazed the path to the moon. He went on to say that the new rocket shows once more that the Socialist system stimulates the swift development of the economy, science, technology and culture, providing unlimited possibilities for the growth of the varied talents of the Soviet people.

The Soviet cosmic rocket supplied a wealth of invaluable scientific information in all fields for which it was designed. Researchers are now busy evaluating and interpreting the data gathered by its instruments.

This bold advance into the depths of the cosmos has opened up new horizons and vast prospects for the broadening of man's knowledge and will serve to benefit the whole world. The old mysteries of the universe will now become more accessible to man, who, in the relatively near future, will be able to set foot on other planets.

MAJOR ADVANCE INTO THE COSMOS

By Alla Masevich

Vice-President, Astronomical Council of the USSR Academy of Sciences

A doctor of physical-mathematical sciences, Alla Masevich is an astrophysicist, specializing in the internal structure of the stars. She is in charge of the optical observation of artificial satellites under the International Geophysical Year program. A professor at Moscow University, she arrived in the United States last December and remained through January along with a Soviet group invited by the American Society of Friends. In an interview given to the magazine *USSR* she said:

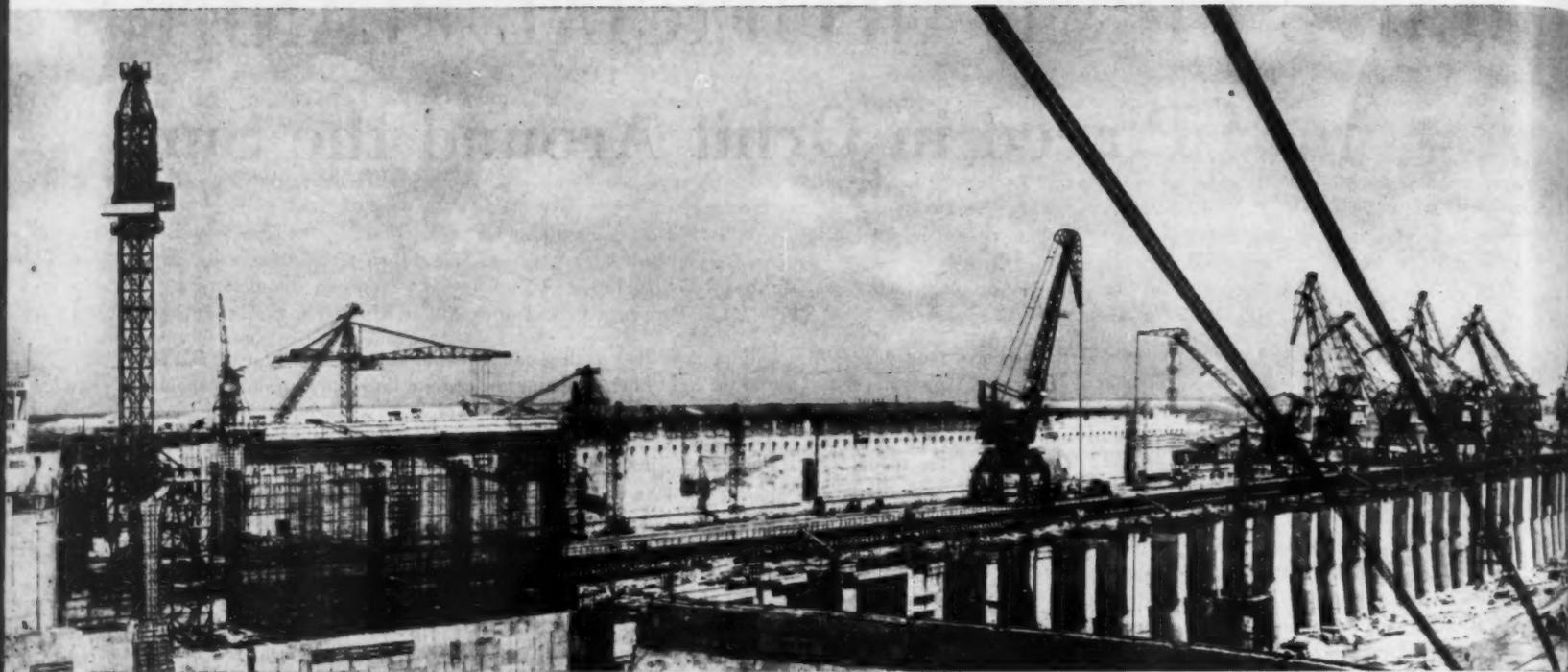
I would describe the launching of the first cosmic rocket now in orbit around the sun as an outstanding achievement of Soviet science and technology. It actually opens a path to the stars and makes reality of our age-old dreams.

All of the data supplied by the rocket will create new possibilities for scientists in the study of the cosmos. As for myself, since I am an astrophysicist, the exploration carried out by the cosmic rocket on gas components of interplanetary matter as well as the data it gathered on corpuscular solar radiation are of special interest.

All of this and additional information which has become available through the launching of the cosmic rocket will throw new light on the origin and development of stars and many other important problems.

It was especially significant that I listened to the radio signals of the new Soviet rocket while on American soil. This is a demonstration of how close we've all become in the common work of scientific research and progress. I feel that the instant reaction of American scientists and the public generally expressed in their warm congratulations to the Soviet people on this outstanding achievement was most heartening.

We Soviet people have taken our stand for international cooperation of all the world's scientists in every field, and in this latest scientific advance wish to emphasize that our chief interest is in its peaceful use for the benefit of all mankind.



MAMMOTH POWER PRODUCER. THE VOLGA'S STALINGRAD HYDROELECTRIC STATION, NOW NEARING COMPLETION, WILL HAVE A CAPACITY OF 2,500,000 KILOWATTS.

ONE GIGANTIC BUILDING SITE

By Iona Andronov

PEOPLE who have visited the Soviet Union in recent years have described it as one gigantic building site covering the better part of two continents. This is more factual statement than figure of speech. Wherever one goes, in big city or tiny village, construction is under way. Everywhere building projects of a hundred diverse kinds are changing the landscape, on Central Russian and Ukrainian plains, in the Ural Mountains, in Siberian forests, in Central Asian deserts and on the Arctic coast.

One out of every ten Soviet workers is employed on some type of construction project, five million people building everything from apartment houses to power stations—new steel mills, furniture factories, printing plants, schools, theaters and every other conceivable kind of structure.

Cities and towns are being expanded. Villages are being completely reconstructed. Forest and desert are being pushed back to make room for new towns. In the years since the Second World War the number of towns with populations between 10,000 and 500,000 grew from 930 to 1,500. New projects to the number of 100,000 are now under construction

and many of them will, before long, be adding their productive capacity to the country's presently operating 200,000 industrial enterprises.

The scale and intensity of construction is greatest in the sparsely populated eastern regions, in Siberia, the Far East and Kazakhstan. Some of the new towns—Angarsk is one of them, on the Angara River, near Lake Baikal in Siberia—are to be found only on the most recent of maps.

A new town is growing up around the communities built in the past two years for workers on the Bratsk power project, the second on the Angara River. Farther west, on the same 56th parallel, big new plants are being built near Krasnoyarsk, one of the leading cities of this booming industrial region on the Yenisei River. Shelikhov, Mirny, Korshunovo, Molodyozhny, Shumikha and Mezhdurechensk, all fast growing towns in the heart of the Siberian forest regions, will be new centers for the production of machinery, aluminum, nonferrous metals, iron and steel, and for mining of coal and diamonds.

Building materials—cement, bricks, slate and precast concrete sections—are in pressing demand everywhere in the country and are

being turned out at a pace greatly exceeding that of other industrial supplies. The number of basic building machines has nearly doubled since 1955, and now the building industry has 50,000 excavators and bulldozers, more than 35,000 mobile cranes and tens of thousands of other machines.

This over-all mechanization has made for economical building. Since 1955, with only a 16 per cent increase in man power, the volume of output in building has increased by 47 per cent. Technical progress has contributed to the higher productivity. One of the newer developments, for example, is rolling mill manufacture of reinforced concrete sections. The Soviet Union now produces more precast reinforced concrete than any other country.

New Plants Built—Old Plants Modernized

Eight hundred new industrial enterprises were erected and began operating in each of the past three years. These are large plants equipped with modern machinery and automatic units that employ anywhere from 1,000 to 10,000 workers. Close to two-thirds of the country's workers are employed in plants this big. These new enterprises attract a considerable part of the two million young men and women who join the nation's working force every year.

Besides these large plants there are innumerable smaller establishments set up each year—factories, farms, commercial agencies and public utilities. For a complete picture of the rate of economic growth, we must add to these new units the increase in production capacities achieved by modernization and expansion of older plants.

Renovation has been going on at plants all over the country. The Audejas Factory in Lithuania is typical. Until quite recently it was a small unit that manufactured simple cotton kerchiefs and bedspreads. Now, enlarged and modernized, it is a substantial mill with an annual output of 600,000 pounds of yarn and more than half a million yards of tapestry and upholstery fabrics.

This expansion is not confined to production areas, it carries over into distribution as well. Railroad lines have been extended each year. Up to 1956, close to 70,000 miles of new track was laid, enough to circle the equator two and a half times with track left over. Part of the modernization involves electrification of the country's railroads, a program which is proceeding at a rapid pace. Today Soviet railroads lead the world in volume of traffic they carry.

The increasing modernization of old plants and construction of new ones creates a large demand for the most modern equipment. A good example is provided by the metal-working industry where the number of machine tools has increased from 710,000 to 1,840,000 compared with the prewar years, with a nearly threefold rise in semi-automatic and automatic machines. The present capacity of motors running indus-



INCREASED CAPITAL INVESTMENTS HAVE ACCELERATED FARM MECHANIZATION

trial machinery has also been expanded—the kilowatt increase has been from 17 million to 58 million.

Although most of the new equipment is home built, a considerable part is purchased abroad. The Soviet Union offers a large and steady market to foreign manufacturers of metallurgical, power, forge and press, hoisting and transport, chemical, ore mining, woodworking, pulp and paper, printing, television, refrigeration and food equipment—in fact, to manufacturers of practically every kind of industrial and farm equipment.

Ever Mounting Capital Investments

Capital investments for building and equipping industrial, agricultural and service enterprises and for housing, schools and medical centers have risen steadily. The only time that capital investment was curtailed was during the war.

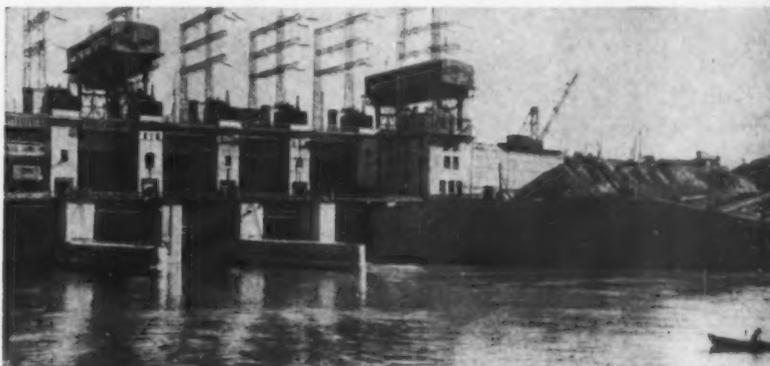
This mounting capital investment makes it possible to expand production capacities and increase output at a rapid rate. In 1957, for instance, three and a half times as many new pig iron capacities were put into operation as in 1953, and approximately twice as many steel power and cement capacities.

Planning on a national scale permits a distribution of capital investment that will speed development of key regions and industries. Thus, capital investments in the building materials industry for 1957 were increased by 27 per cent, in housing construction by 29 per cent and in agriculture by 21 per cent.

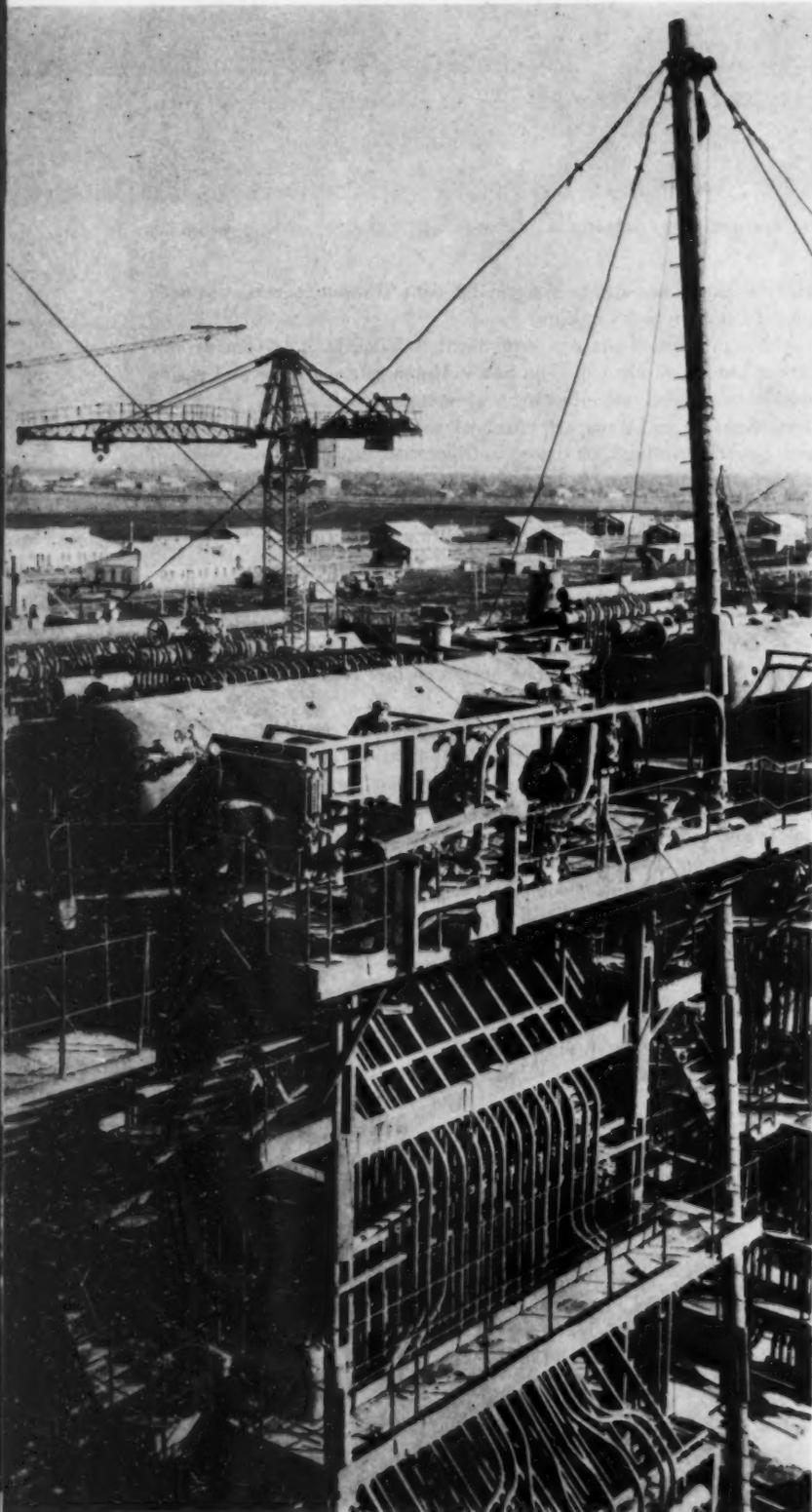
THE COUNTRY'S NEW PLAN SETS A PROGRAM OF GREAT INDUSTRIAL GROWTH.



NEW IRRIGATION PROJECTS BRING LIFE TO CENTRAL ASIA'S DESERTS.



ONE GIGANTIC BUILDING SITE



THE POWER PLANT OF A SUGAR REFINERY GOING UP IN KRASNODAR TERRITORY.

Last year industrial chemicals, and particularly the plastics and artificial fibers industries, were allocated large capital funds to accelerate production. The rapidly growing plants will soon be turning out very large supplies of materials for consumer goods. In a matter of a few years, synthetics together with natural materials will be meeting vastly increased consumer needs for fabrics, clothing and footwear.

Building on the Farms

Government capital investments in agriculture in the past five years came to more than 97 billion rubles, compared with 40 billion for the preceding five years. This has made it possible to extend mechanization and introduce advanced methods in all branches of farming. It also accounts for expanded housing construction in rural areas, for the thousands of new schools and community centers, hospitals, stadiums and libraries.

Increased investments have paid off in increased grain production, more cotton, fruits and vegetables. There has been a 40 per cent rise in meat output compared with 1953, a 50 per cent rise in milk and a 40 per cent rise in eggs. The average annual rate of growth in the gross output of agriculture in the past four years was 7.1 per cent.

Considerable funds have been allocated for the reclamation of virgin lands in the eastern regions of the country—almost 30 billion rubles in 1954-58. Not only are these outlays quickly offset by increased profits from larger harvests, but they actually lay the basis for a major source of revenue to perpetuate construction programs. Hundreds of new state farms have been built up on the eastern plains, and more than 350,000 young men and women have settled in these new productive agricultural regions.

More and more aid from the national budget to collective and state farms is being given to bring about a further and faster rise in agricultural production. And the capital investments from the funds accumulated by the farms themselves are growing simultaneously.

The Future Planned

The future, one might say, is already being built to plan. Its arithmetic is being calculated by the Twenty-First Congress of the Communist Party whose delegates came to Moscow to sum up the results of the nationwide discussion on the draft proposals. The target figures proposed for the period from 1959 through 1965 are based on the solid foundation of construction already completed that has immensely increased the country's economic potential.

The plan calls for more building in the next seven years than in all the 41 preceding years since the Soviet Union was founded.

As much money is to be invested in the economy between 1959 and 1965 as was spent during four earlier decades—the immense sum of two trillion rubles. Capital investments will be increased by 80 per cent as compared with the seven years before. Industrial investments

22 MILLION NEW APARTMENTS AND HOUSES WILL BE BUILT BY 1965.





A NEW RESIDENTIAL SECTION IN KARAGANDA. THE RICH DEPOSITS OF THIS COAL CENTER IN KAZAKHSTAN PROVIDE FUEL FOR THE REPUBLIC'S FAST GROWING INDUSTRY.

will double, with special concentration in the eastern regions—the Urals, Siberia, the Far East, Kazakhstan and Central Asia.

The amount earmarked for further development in the iron and steel industry is 2.4 times greater than in 1952-58; for the power industry it is 1.7 times greater; for timber, paper and the woodworking industries it is more than double.

The size of the construction program can be illustrated by the chemical industry which is to be allocated a minimum of 100 billion rubles, about half to go for building new plants to manufacture plastics, artificial fibers, synthetic rubber and alcohol. By 1965 the Soviet Union will have built or expanded 257 enterprises in the chemical and allied industries. This includes the construction of 11 factories for the manufacture of

artificial fabrics, 20 silk mills and 28 knit goods and hosiery factories.

For the consumer goods industries 270 new plants are scheduled for construction, and for the food industries 250 new meatpacking plants, 1,000 dairy processing plants and 200 canneries.

The seven-year plan proposes 10,500 miles of new railway track and a considerable expansion in construction of hard-surface automobile roads. More than 90 new airports are to be built for use by turbojet and turboprop airliners with the goal of increasing present air passenger traffic by six times.

In communications the plan calls for a large expansion in radio broadcasting facilities, a 2.6-time increase in the number of television stations and the introduction of color television.

Millions of New Apartments and Houses

Housing construction is to be enormously expedited. The new space to be built during the seven-year plan period will be sufficient to rehouse nearly half the country's total population. Planned for 1959-1965 are 15 million new apartments in cities and towns and seven million new houses in farm regions.

As bold and challenging as these projected figures may seem, they are altogether within the realm of possibility if one considers previous performance. In the past five years alone an approximate six million new urban apartments and more than three million rural houses were put up.

Accompanying this gigantic housing construction program will be new schools, kindergartens, nurseries, hospitals, stadiums, theaters, retail stores and public parks and gardens.

Each year the Soviet Union has been building on a progressively greater scale. Each year its national wealth has been increasing and the real income of its citizens rising. By the end of this seven-year plan, with consumer goods in plenty available, the purchasing power of Soviet workers and farmers will have risen by no less than 40 per cent over today's figures.

An ever rising standard of living helps explain why for the people who take part in the tremendous building program the target figures of the new plan have a special meaning. They represent a better life not only for builders themselves but for every family in the country.

OLD STRUCTURES ARE RAZED TO MAKE ROOM FOR LARGE, MODERN BUILDINGS.



THIS map shows a few of the largest construction projects now under way in the Soviet Union, each one of them a detail in the seven-year plan for the development of every phase of the country's economy between 1959 and 1965.

Budgeted for capital construction for the next seven years is the staggering sum of two trillion rubles, almost double that for the period from 1952 through 1958. More than forty per cent is to go for development of the eastern regions of the country which are particularly rich in natural resources. The Urals, Siberia, the Far East, Kazakhstan and Central Asia are major sources for coal and hydro-power, timber and grain, nonferrous and rare metals, iron ores and building materials.

Dotted on the map are the rising industrial complexes of eastern regions; Kustanai, Sokolovo-Sarbai, Karaganda, Krasnoyarsk, Bratsk, Irkutsk, Blagoveshchensk and tens of others whose names by the time the new plan is completed in 1965 will be synonyms for steel, aluminum, nickel, magnesium, titanium, chemicals, foodstuffs and consumer items of every kind.

The factories and plants now being built will be powered by new thermal and hydroelectric stations with capacities in the millions of kilowatts.

Plotted on the map are many new oil, natural gas and industrial chemical areas where large-scale processing plants are being built. They center around Stavropol and Baku in the Caucasus, around Dashava in the Ukraine, around Kuibyshev, Stalingrad and Saratov on the Volga, and in the region west of Tashkent in Central Asia.

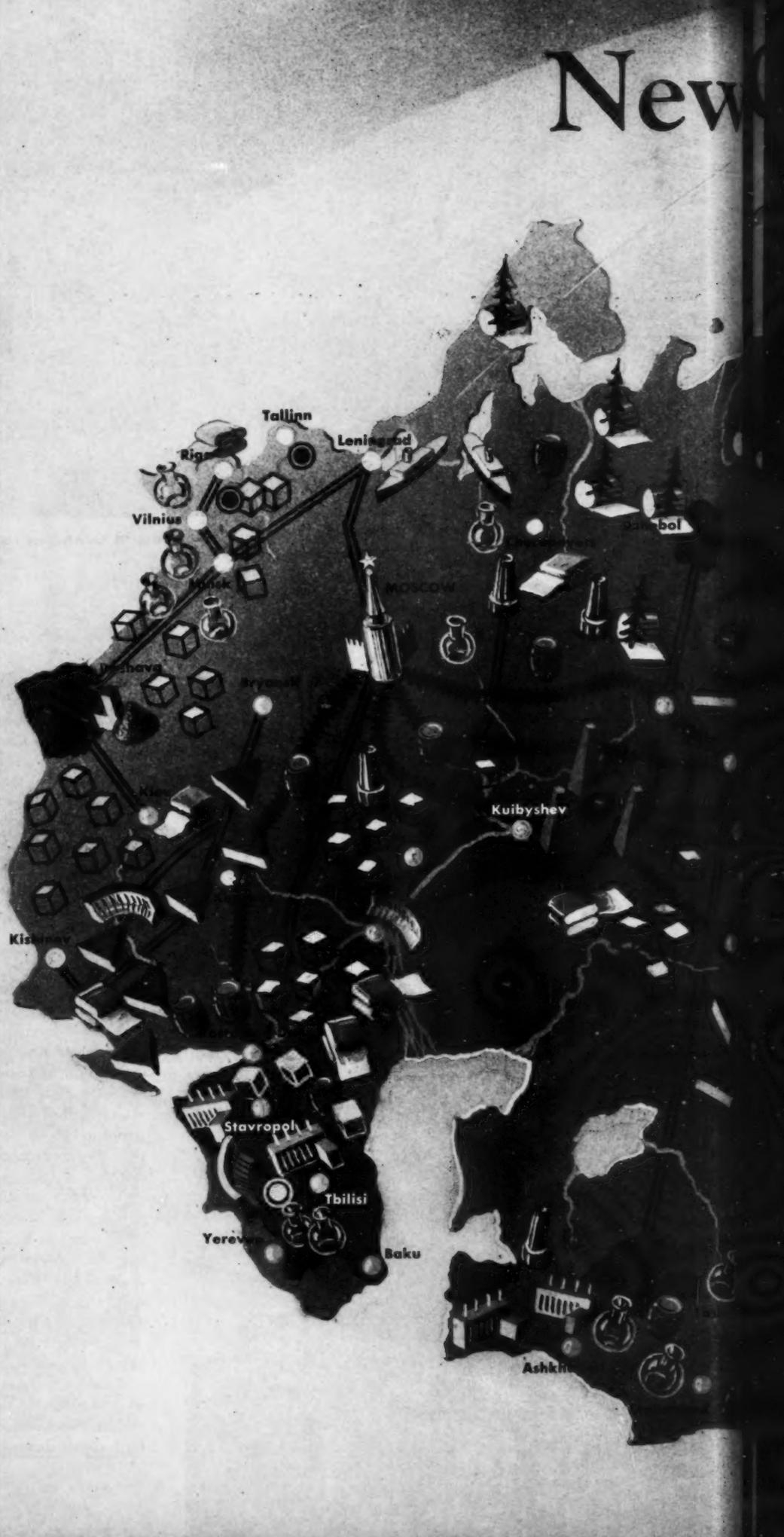
The new gas and oil pipe lines stretch for thousands of miles: from Bukhara in Central Asia to Sverdlovsk in the Urals, from Stavropol in the south to Leningrad in the north; from the Volga shores deep into Siberia.

Shown on the map are the ore deposits north of the industrial city of Kharkov tapped within recent years. These form the Kursk Magnetic Anomaly with reserves rich enough for centuries of future iron and steel production. New iron and steel cities are rising there, in the heart of the European part of the Soviet Union. Others are being built further to the north, around Lipetsk, Cherepovets and other places.

Around such gigantic power stations as the Stalingrad hydroelectric project on the Volga, the Votkinsk on the Kama, the Kremenchug on the Dnieper are the new industrial towns for machine building, instrument making, electronics and chemicals. Everywhere in these booming regions one sees new farms and food processing plants, textile mills and factories of a hundred diversified kinds for consumer goods production.

New railroad tracks are being laid through these towns in construction. They will be running both electric and diesel trains. Many of the older railroads are being modernized. Within the next seven years the country's length of electrified trackage will have tripled.

The map traces the transcontinental Moscow-Kuibyshev-Irkutsk-Vladivostok railroad, the longest electrified line in the world. Running parallel to it are the South Siberian and Mid-Siberian railroads.



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FACTORY



Construction Projects 1959-1965



Unity of the People and the Communist Party

The Twenty-First Congress of the Communist Party is a landmark in the life of the Soviet Union, drawing the attention of the whole nation to its deliberations on the country's economic future. Plans for this future were prepared by the entire previous development, by the efforts of all Soviet people under the leadership and guidance of the Communist Party.

Soviet people are justly proud of what has been done since the Twentieth Party Congress met in February, 1956. Fulfilling the program charted by that congress, the country scored remarkable achievements in industry and farming, science and technology. Economic progress resulted in a further rise of living standards, in social and cultural advances.

New legislation passed during the last three years shortened the working week without reduction in pay, raised the wages for lower-paid workers, boosted pensions for all, lowered the taxes and increased paid maternity leaves for working women. There were more and better consumer goods, an expansion in housing construction and improvements in the educational system.

Presented on these pages are interviews with Soviet people of various occupations who were asked to tell about their life and work in the period between the Party Congresses. Their replies demonstrate how the people's desires are embodied in the policies of the Communist Party.

"THE GREAT FUNCTION OF SCIENCE IS TO CREATE"

Academician Nikolai Semenov
Nobel Prize Winner in Chemistry

THESE past three years were very crowded ones for scientific progress in the Soviet Union. In my own field, chemical research, as well as in other fields, there was a very great acceleration forward as a result of plans charted by the Twentieth Congress of the Communist Party. The period between now and 1965 will see even more rapid progress in industrial chemistry, particularly in plastics and artificial fiber.

For me personally, these were gratifying years. In 1956, on my sixtieth birthday, I was honored with the Order of Lenin. At the close of the same year the Swedish Academy of Science awarded me a Nobel Prize for studies in the kinetics of gaseous reactions. Last year I was elected a foreign member of the British Royal Society.

In 1958 I was elected Academic Secretary of the Chemical Sciences Division of the USSR

Academy of Science, and I now devote much of my time to extending the activities of the Academy's chemical institutes.

I have recently completed my book *Problems of Chemical Kinetics and Reaction Capacity* which will shortly be published. In translation it will be also published in the German Democratic Republic, Britain and the United States. The American edition of my book will have the Princeton University Press imprint.

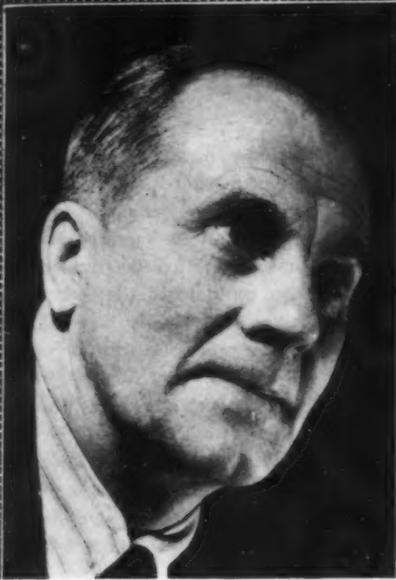
It was my pleasure these past years to meet with foreign colleagues at scientific conferences in my own country and in Sweden, Czechoslovakia, Greece, Belgium and Switzerland. At the Brussels Fair I was one of four scientists respectively representing the Soviet Union, the United States, Britain and France to speak at the symposium "On the Destiny of Man in the Atomic Age."

My thought was that in its present stage of development science has all the possibilities for providing a good life for all the people of our earth. Geared to a race for armaments it can bring about unprecedented disaster. It is the duty, therefore, of every thinking person, and of scientists in particular, to work unitedly to preserve peace.

The possibilities of chemistry, if we consider only this one field of science, are practically limitless. With the study of polymers, we have opened up inexhaustible prospects of new materials artificially created and endowed with desirable properties. These chain reactions which we call polymerization may prove to be as vastly significant in biological processes as they are in chemistry and nuclear physics.

It is chemistry which is working to solve the very greatest problem of science, the transition from the inanimate to the animate—the origin of life itself. This is the great function of science—to create and preserve life, not to help destroy it.





"SIBERIA IS A TREASURE HOUSE OF NATURAL RESOURCES"

Konstantin Filatov

Chief, Mineral Resources Board of the Russian Federation

SIBERIA, the country's great treasure house of natural resources, has been developing with extraordinary rapidity in the three years since the last Party Congress. Its sedimentary and eruptive rocks contain coal and iron ore, non-ferrous and rare metals, gold and diamonds. Geologists have uncovered rich deposits of all kinds of minerals and around them have risen new industrial centers.

Topping the list of Siberia's resources is coal, roughly 90 per cent of the country's known deposits. Coal fields have been found which permit opencast mining. Eastern Siberia has all the iron ore needed for a large iron and steel center. The projected Kras-

noyarsk iron and steel mills will be tapping the abundant ore of the Angara-Pit Basin.

Diamond fields no less rich than those in South Africa are now being worked in the Yakut Republic in Eastern Siberia.

Large deposits of natural gas have been found in the estuary of the Vilyui River. The first Siberian pipe line when it is built will be carrying this gas to Yakutsk.

So many kinds of minerals have been found in Siberia in these past few years that they could completely fill in Mendeleev's Table of Elements. Unquestionably this enormously rich region will have central emphasis in the country's new economic plan.

"I CAN BUY MORE WITH WHAT I EARN"

Nikolai Afanasyev

Lathe Operator

A LOT of the planning done by the Twentieth Party Congress was pretty directly tied up with my work these past three years. Take my job at the Leningrad Metal Works. Last spring I was machining the rotor for a big 200,000-kilowatt steam turbine, bigger than anything the shop had ever turned out.

And that's only a beginning. The new plan for 1959-1965 calls for an expansion in the construction of thermal power stations. Our plant's engineers are already working on steam turbines with capacities of 300,000 and 400,000 kilowatts. The plan for 1959 is to turn out 1.5 times more turbines than last year.

How does that affect me directly? The more power the country gets, the more goods are turned out in less time and with less labor, and so I can buy more with what I earn. In

this last period, for example, although my wages went up by 3 per cent, prices either stayed the same or went down.

Or take housing, part of the same picture. More power means more building materials turned out faster. Fifty-four new apartment houses went up in my neighborhood. I got an apartment in one of them.

My two children study in a school that was just built, and two more schools are going up now in our neighborhood. Close by we have a community center, a movie and a hospital, all brand new, and a new boulevard is being laid out on the Neva Embankment.

Like other workers at the plant I've tried to make my own contribution to the plans worked out by the last Party Congress to raise the standard of living all along the line by giving the country more power. I've made



five work-improvement proposals in the past couple of years, for which I got bonuses. I'm not an engineer, but I've been working at a lathe for 27 years and by this time I know what you can get out of a machine.

"I SET MYSELF A STUDY PLAN"

Nikolai Lomakov

Watch Factory Engineer



THESE have been a tough three years for me. I set myself a study plan and it was no easy business keeping at it while I was holding down a full-time job.

I started at our watch factory as a shop worker in 1946. Little by little I worked my way up to the position of shop superintendent. It was then that I had geared myself to earn an engineer's diploma. I had four classes a week and that left me very little time for anything else, especially during the last years of study.

Now it is all over and I have my diploma. College graduation brought me a new promotion—I am now assistant factory manager of production.

I wasn't the only one to take on a study program. We have our own technical school at the factory. Many of our workers are enrolled in advanced training courses.

It's almost a necessity to keep abreast of new technological developments, and there have been many in our industry. Our factory has new automatic production lines that have mechanized most of the manual operations.

In the past three years we put out 47 different types of men's and ladies' watches and alarm clocks. During the years between the Party Congresses we have manufactured more than eight million timepieces—from alarm clocks to the elegant Era ladies' wrist watches. Our watches were displayed at the Brussels World's Fair and won a prize.

Future plans? More study. It's gotten to be a habit by now. I want to learn German in the next two years. It will be useful in my work. Then, I'd like to take a trip to Switzerland and France. And finally, I'm looking forward to moving to one of the apartments which the plant is building for its workers.



"A FAST GROWING IRON AND STEEL CENTER"

Alexei Sakharov
Chief Engineer, Cherepovets Iron and Steel Works

IT WAS three years ago that the Cherepovets Iron and Steel Works began operating, and now our old town in the northwest part of the country is almost unrecognizable.

Cherepovets is in the middle of an already highly developed machine-building region. But up to now the supply of steel has had to be hauled in from long distances. With the plant expanding to full capacity, it will soon be supplying rolled steel to meet all the region's needs.

The plant is young and much of our technique has been learned from such older iron and steel centers as Magnitogorsk and Kuznetsk. We have not only caught up with, but

in some ways we have been moving ahead faster than our teachers.

Our expenditure of coke per ton of pig iron is the lowest in the country. Our blast furnace workers have exceeded rated capacities by 20 per cent. In this last period some 800 suggestions made by workers have been introduced into processes with a saving of three million rubles.

One of the oft-repeated words heard at the plant these past months preceding the Twenty-First Party Congress has been "semiletka," the Russian for septennial. This is our seven-year plan for the plant's growth that ties in with the plan for the whole country.

"WE'LL HAVE TWO DOCTORS IN THE FAMILY"

Yekaterina Tverdokhle
Collective Farmer

IF YOU walk through our collective farm village here in the Ukraine you'll see many new houses. In these past three years we've had dozens of housewarmings.

The barns are also new and so is the big garage that our collective farm put up to hold the machinery we bought from the local machine and tractor station. It was reorganized into a maintenance depot according to a law passed last spring, and we bought 14 tractors, 9 grain and beet harvesting combines, 17 trucks and other kinds of tools.

For a good many years now I've been working with a group of other collective farm

women on our sugar beets. We've been taking in bigger crops than we ever did, and with bigger crops, our share of the farm income has been bigger.

So far as my particular family is concerned, the happiest news last year was that my brother Sergei's two daughters became students at the Kharkov Medical Institute. They will be the first doctors in our family. When my 94-year-old father heard the news, he kept shaking his head and repeating, "Where did you ever hear in the old days of a peasant's daughter becoming a doctor—and two of them in the bargain?"



"I'VE MOVED TO SIBERIA"

Boris Melikhov
State Farm Worker



I'VE MOVED more than 3,000 miles—from my native town of Klintsoy to Siberia. I'm now living in a new village which didn't exist when I came.

My address is not the only thing that changed in the three years since the Twentieth Party Congress but my trade and my whole way of life with it. It happened this way.

When I graduated from secondary school I entered a trade school to become a fitter. But when the call came for volunteers to go out to Siberia and Kazakhstan to cultivate the virgin lands, so many of my friends volunteered that I made up my mind to go with them.

I came to Altai Territory with a big group of other young men and women. Prefabricated houses were being shipped to the site where the farm was to be laid out, but we didn't wait for them to arrive. Spring was close on our heels and we got down to work right away. We camped out until the houses were set up. There were many evenings when we'd be sitting in our tents, tired out after a

day's labor in the field, and talk about what the farm would look like in a couple of years.

I don't think any of us really thought it would grow so quickly. Our Kulundinsky State Farm now has more than 75,000 acres of wheat under cultivation. And there's a neat village of houses, club, hospital and nursery that's growing fast.

I've made enough to buy one of the houses built by the farm management. I started out as an ordinary farmhand. Then the farm management had me take a six months' course for machine operators and put me in charge of a field crew that cultivates a tract of 10,000 acres.

I liked it here and settled down at the farm for good. My two brothers and my grandmother have come here to live, too. It was my grandmother who raised all sorts of objections when I originally said I wanted to move to Siberia. And now I'm expecting my father and mother, who have decided, after a lot of thinking, to leave our native town and come out here to join the rest of the family.

Unity of the People and the Communist Party

"A PEACEFUL WORLD FOR MY CHILDREN"

Maria Stakhanova
Housewife

SPEAKING as a mother I can say that the main event in our family during these past years was the birth of our daughter Tanya. Now she is almost three. Our son Volodya is at school and getting good marks. So is my husband, Alexander Stakhanov, who is taking a correspondence course at the technical school of the fishing industry. Both of them have a kind of race every evening to see who gets through with homework faster.

Alexander works as a mechanic at the As-trakhan shipyards and the whole family was very proud that a model of a machine tool which he and another mechanic designed was

displayed at the city industrial exhibition.

Last year we finished paying up the seven-year loan which we made from the state bank to build our new house. So that now we're free and clear and we're beginning to put up a summer cottage. On the plot of land we received we've already planted apple and pear trees and grapevines.

For the future, my most earnest wish is to see my children growing up in a peaceful world, the same wish that a mother anywhere else in the world has. It's easy to start a fire but very hard to put it out. I've gone through one war, it's enough for a lifetime.



"OUR CUSTOMERS ARE MUCH MORE FASHION CONSCIOUS"

Lilya Belova
Dressmaker

MY JOB is making ladies' dresses. One of the things our shop has never lacked in the past three years is customers. More people have been buying clothes because they have more money to spend.

Ours is a custom shop, one of the largest in Moscow. Although there are plenty of ready-made dress stores, there are enough women who want their dresses made to order to keep every tailoring shop busy for months in advance.

After the rush of the New Year holiday season we are now preparing for the spring. I make dresses for students and schoolgirls and my busiest days are just before graduation, in May, getting the girls dressed up for school dances and balls.

In our shop we have 120 dressmakers, most of them young people and practically all of them studying so they can qualify for the best jobs in the trade. In 1957 I took a six months' course in cutting and pattern-making. Now I make 1,200 rubles a month instead of the 800 I used to get.

Our shop is one of the most popular in the city, it has qualified for the "de luxe" rating. We follow the designs of the Moscow Fashion House and the latest Paris and New York styles.

We've noticed that our customers have become much more particular and fashion-conscious in the past few years. That's all right with us. We like to see them wearing well-designed and well-fitting clothes.



"I SHIFTED FROM THE ARMY TO TELEVISION"

Yevgeni Matusovsky
Manager of a Radio-Television Store

MY LIFE has taken an entirely new turn since the last Party Congress. I had been an army officer for 30 years before then and as a result of the cut in the size of the Soviet military forces—which came out of the congress—I was demobilized.

I had a fairly good background in radio engineering, so I decided to go into that field. I had no difficulty getting placed as manager of a radio and television store. Although I had no retail trade experience, I get along with people and the experience came.

We do a particularly big business in television sets. Three years ago we had only two kinds of sets, now we have more than a dozen of different types. The models we sell in our store range from the large de luxe Ruby-102 which received worldwide recognition to the miniature portable Sputnik based on transistors.

There is also a great demand for various models of radio sets, record players and tape recorders. All told, our store does about five million rubles' worth of business a month.



Unity of the People and the Communist Party



"NEW GREAT THEMES FOR OUR WRITERS"

Kara Seitliyev
Turkmen Author

WRITERS in Turkmenia these days are having to rush to catch up with life. Since the Twentieth Congress of the Communist Party so much has happened in our republic, the changes have been so rapid and so startling that they challenge even the extravagant imagination that tradition attributes to Oriental poets.

Irrigation has meant a new life for the Turkmens. Year after year for untold centuries the hot winds blown in from the Central Asian deserts east of the Caspian have scourged the land. How many farmers must have stood helpless while drought withered their crops.

Now the sands are being pushed back. The first section of the Kara-Kum Canal now completed has brought water to millions of acres of new lands.

The canal makes possible a great expansion of land sown to cotton, the main crop in Turkmenia. And more cotton means, of course, more income for our collective farmers.

Industrially, too, Turkmenia has been pushing forward. New oil, gas, mineral and sulphur deposits have been found in these past three years, and gas pipe lines and chemical plants are being built to process and convey them to manufacturing centers.

All this bustling life is subject matter for our novelists, poets and dramatists. Berdy Kerbabayev, a well-known Turkmen writer, has written *Nebit-Dag*, a novel about Turkmen oil workers which has been translated into many of the languages spoken in the Soviet Union.

Many of our younger writers get their themes and material by working on construction sites alongside the men. Poet Berdy Nazar Khudainazarov wrote his poem *Hot Steppe* out of his experiences as a worker on the Kara-Kum Canal project.

Although I'm beginning to get on in years, I find these "life-to-literature" trips, as we call them, most stimulating. For several months I lived at one of the cotton-growing collective farms. I worked in the fields and ate and slept in the field camps. The multitude of impressions I tried to convey in my poem *A Talk with the Amu-Darya*.

I am now preparing a book of my new poems for publication, and shortly to be published in a Russian translation is a selected volume of my poetry.

The present Party Congress will certainly bring about still greater projects than are now in progress. These are the great themes of the future for our Turkmen writers.

ONE of the important proposals made at the Twentieth Party Congress called for a further increase in book publication. In the three years since, Soviet publishing houses have brought the annual issue to a staggering total of more than a billion—a fifth of the entire world output for a year. The average world figure is two books per person, the Soviet Union prints 5.5.

Books are published in 89 different languages. Belles-lettres, both Soviet and foreign, make up about a third of the total. Last year we issued books by writers of 47 countries, the United States included. The most popular American authors here are Jack London, Mark Twain, O. Henry, James Fenimore Cooper and among contemporary novelists, Theodore Dreiser, Ernest Hemingway and Mitchell Wilson. Jack London and Mark Twain alone have been printed in a total of 30 million copies.

Publication of children's books has grown by more than 30 million copies in the past three years. Textbooks are printed in 60 languages of the country's peoples. In 1957 they totaled 275 million copies.

The decisions of the present Party Congress will mean even greater progress in book publication. The demand of our readers for more books is so great and so constant that we can hardly keep pace.

"ANNUAL BOOK PRINTING TOPS THE BILLION MARK"

Alexander Rybin
Chief, Publishing Division of the USSR Ministry of Culture



SCANNING THE PAGES OF SOVIET HISTORY

Civil War and Reconstruction

By Yuri Polyakov, Historian

Last November, issue No. 11 (26) of our magazine carried an article describing the historic events of 1917 when Russia's czar was overthrown and, as a result of the Socialist Revolution, the Soviet Government was established with Lenin at its head. This article continues the history of the world's first Socialist Republic through the period of civil war, foreign intervention and reconstruction.



The cavalry army formed by workers and peasants to defend their new Socialist Republic in the Civil War showed a rare kind of devotion and heroism.

Heroes of the Civil War — Klimenti Voroshilov (at the right), now President of the Presidium of the USSR Supreme Soviet, and Semyon Budyonny, now Marshal of the Soviet Union.



THE history of the decade of civil war, foreign intervention and reconstruction from 1918 to 1928 is a stirring epic of a people fighting to defend the Socialist Republic it had established as a result of the October Revolution of 1917. It was a revolution which had freed Russia's workers and peasants from a feudal burden of economic, social and political oppression, the like of which no people in Europe had known. With the overwhelming majority of the suffering population behind it, the Revolution was won quickly, easily, at practically no cost in lives.

But no sooner did the Revolution end, than the enemy gathered its forces for attack. Combined against the people were the landlords whose estates had been expropriated, the industrialists whose mills and factories had been nationalized, the feudal princes who had ruled vast regions in the country, and the officialdom and monarchist officers' corps whose privileges had vanished with the Revolution.

Hardly had the Republic been set up and the first decrees on land and peace proclaimed when the guns began to roar at the approaches to Petrograd. Alexander Kerensky, premier of the deposed Provisional Government, and the reactionary General Krasnov at the head



MOSCOW'S RED SQUARE IN 1919. A UNIT OF VOLUNTEER SOLDIERS BEGIN THEIR MARCH TO THE FRONT.

Civil War and Reconstruction

of Cossack cavalry regiments moved on the city. The attack was thrown back by armed workers, sailors and soldiers.

With this open attack a failure, the enemies of the Revolution set up underground groups in Moscow, Petrograd and other cities and inspired counter-revolutionary outbreaks all over the country. Their purpose was to create civil war and they stopped at nothing, whether plot, insurrection or assassination, that would achieve their end, the overthrow of the Soviet Republic.

Although dangerous, the counter-revolutionary forces within the country were comparatively weak. Without external support they could easily have been put down. This had been forcefully demonstrated by events at the end of 1917 and early 1918 when armed workers' detachments very quickly subdued a series of uprisings by reactionary officers which sprang up in various parts of the country. The internal enemies were, however, abetted in every possible way by foreign governments which took part openly and brazenly in the war against the Soviet Republic. The Civil War, therefore, continued with incalculable losses and years of suffering as the result.

The Republic in Danger!

At dawn of February 22, 1918, the inhabitants of Petrograd, Moscow, Tver, Yaroslavl, Bryansk and many other Soviet cities were awakened by the alarm of sirens and whistles. They flooded into the streets and in the dim light cast by the street lamps read the handbills posted on the walls. "The Socialist Motherland is in Danger." It was a government decree signed by Lenin that called upon all citizens to come to the defense of the Revolu-

tion and the Republic. German divisions were marching upon Petrograd. On that same day 40,000 volunteers joined the Red Army in Petrograd, more than 60,000 joined in Moscow.

Detachments of the newly organized Red Army threw back the vanguard of the German troops approaching Petrograd. A granite monument near the old town of Pskov stands witness to that memorable February 23, 1918, when the Red Army first halted the German offensive. That day has ever since been celebrated as Soviet Army Day to commemorate the great mobilization of the people in defense of the Republic.

This was the sequence of events that led to the German invasion. Russia up until the October Revolution had been one of the Entente nations at war with Germany, Austria-Hun-

gary and Turkey. In the three and a half years of war Russia's losses—men killed, wounded and taken prisoner—were heavier than those of all the other Entente nations put together. Her economy had been completely destroyed and her people had suffered desperately from cold, hunger and pestilence. They demanded an end to the war.

As early as the next day after the October Revolution, the Soviet Government, in its first decree, called upon the belligerent powers to conclude a just peace without annexations or indemnities. The governments of the Entente powers did not even trouble to reply, and Russia was compelled to open negotiations for a separate peace with Germany.

Germany had agreed to negotiate, but it soon enough became clear that she had no intention of concluding a just peace. On February 18, 1918, her guns opened fire. Seven hundred thousand German and Austrian troops attacked along a front that reached from the Gulf of Riga to the mouth of the Danube. With no real resistance from the demoralized old Russian army the enemy divisions advanced rapidly until the way was open to Petrograd, Kiev, Moscow and other vital cities.

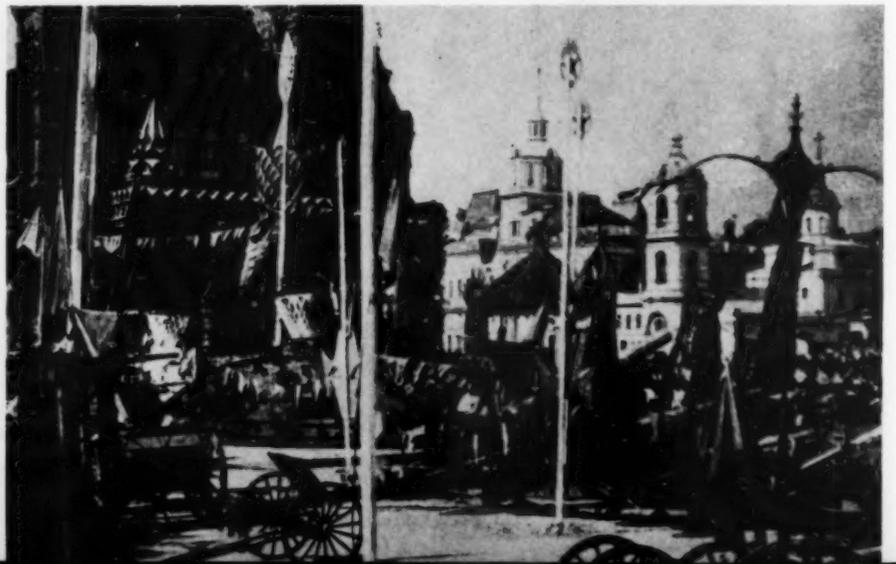
Kaiser Wilhelm's generals were confident of easy victory, certain that the Soviet Government would be overthrown and the country subdued. But this was a new Russia they were facing, with mighty forces for resistance which until then had lain dormant.

The Soviet people were prepared to make heavy sacrifices to end the war. But this ruthless enemy had launched an attack to wipe out the gains won by the Revolution, to destroy the new life they had begun to build. This they would not permit. The peace terms were most severe and onerous but there was no recourse. The Republic desperately needed a breathing spell. On March 3, 1918, the treaty was signed. Soviet Russia lost all the Baltic provinces, Byelorussia and the Ukraine and was forced to pay an enormous indemnity.

Foreign Invasion

The respite paid for so dearly, however, was short-lived. An attack came very soon from the country's former allies. On March 9, 1918, British soldiers were landed in Murmansk, followed by troops from France and a larger

MILITARY TROPHIES CAPTURED BY THE RED ARMY IN THE CIVIL WAR WERE EXHIBITED IN MOSCOW IN 1919.





Vasili Chapayev, a carpenter, led a celebrated Red Army division and became one of the most famous and popular leaders of the Civil War. His exploits, woven into song and story, have become a vivid part of Soviet history.

British detachment. In April, Japanese troops invaded Vladivostok. Interventionist armies attacked from the south also. British forces dispatched from Persia captured Baku and Turkmenia. All told, the armies of fourteen powers had moved in to throttle the first socialist state.

The counter-revolutionary forces within the country gathered with renewed hope. The Cossack chiefs launched attacks in the Don and Orenburg. An army of reactionary officers led by General Denikin captured the North Caucasus. There were insurrections in the north, the Volga region, Siberia and the Urals.

The attack came almost simultaneously from all sides. Three-quarters of the country fell to the enemy. Only a small patch of territory in Central Russia flew the Soviet flag and the Entente threatened the heart of the country—Moscow itself.

Nor was the counter-revolution the only enemy. When the interventionists captured the granaries—the Ukraine, Siberia, most of the Volga region and the North Caucasus—the serious food shortage from which the people had suffered since the beginning of the war took on the character of wholesale famine.

In addition, the country was kept in a state of turmoil by insurrections which flared up periodically and by terrorist activity directed and financed by foreign agents. Among those assassinated were the Soviet leaders Uritsky and Volodarsky. An attempt was made on Lenin's life, he was severely wounded by two poisoned bullets.

The days of the Soviet state seemed to be numbered. Here were the troops of fourteen world powers fighting against a country which was all but devastated. And with them the forces of the internal counter-revolution amply supplied with arms from foreign arsenals. But revolutionary Russia, hungry, suffering, fighting with little more than bare hands, refused to surrender.

The People's Army Forms

The grim struggle went on from 1918 through 1920. "A revolution is worth something only if it can defend itself," Lenin said at the time. The Soviet Republic created its own defense, an army of incredible staunchness and heroism made up of Russia's workers and peasants. It was an army to defend their Revolution. Its strength grew with every passing day until by the end of 1920 it numbered more than five million men.

There were officers who had served in the czarist army and now labored devotedly to build up the armed forces of the Soviet Republic. Many were talented commanders who subsequently became Red Army generals and marshals. Out of the ranks of the workers and peasants, too, came many famous army leaders.

Mikhail Frunze, an active participant in the October Revolution, commanded an army that won victories over Kolchak and Wrangel. Kliment Voroshilov, a Donets metal worker, now President of the Presidium of the USSR Supreme Soviet, was in command of the front at Tsarytsin (later renamed Stalingrad). Semyon Budyonny, a peasant and non-commissioned officer of the old army, organized and led the first guerrilla cavalry group which later grew into the legendary Cavalry Army. The exploits of carpenter Vasili Chapayev and his celebrated army division have been woven into song and story and are known to every schoolchild in the country.

In this people's army the members of the Communist Party were among the most courageous and self-sacrificing. A code of behavior for Communists mobilized for the front included these words: "The title of Communist demands many obligations, it offers only one privilege, to be the first to fight for the Revolution." Upward of 300,000 Communists fought in the Red Army. It was their untiring and selfless work that forged this army of workers and peasants into the well-disciplined

force that drove the foreign invaders from Soviet soil and defeated the armies of Denikin, Yudenich, Kolchak, Wrangel and other generals of the internal counter-revolution.

A leaflet issued at the time explained the task of the people's army in terms every worker and peasant who had suffered under the czar understood:

"Arms are given to the workers and peasants for self-defense. Arms are given to the soldier to defend his own interests, to defend the land and freedom, to defend the interests of the poor in town and country.

"A Soviet soldier is defending his own cause, the government he himself set up and which is responsible to him.

"The working people who place arms in the hands of the Soviet soldier bless him for his courageous fight against the enemies of the Revolution, bless him as a mother would her own son."

Rallied around the Communist Party were the country's people. All the other parties—the Socialist-Revolutionary, Menshevik, Anarchist and nationalist parties of all hues—had lost whatever influence they had exerted prior to the October Revolution and the first few years after it. Tested by civil war and foreign intervention they exposed themselves as enemies of the people. They cooperated with the invaders, took their stand with the counter-revolution.

The Communist Party alone led the fight for freedom, shared the privation of those rigorous years, fought for a program and course of action that transformed this backward ruined land into the Soviet Union we see today.

The Country Transformed

Even in the midst of civil war that transformation was evident. A new country was beginning to emerge with changes taking place in every sphere of life. The remnants of feudalism were destroyed, the privileges of the



Subbotnik (from subбота, the Russian word for Saturday) was the name given to the community work performed on weekends and holidays. The voluntary contribution by millions of people of their energy and skills for the good of the country with no thought of monetary remuneration was a new phenomenon woven in the Soviet society.

Civil War and Reconstruction

aristocracy abolished. Women were given equal rights with men.

The landed estates were nationalized and the land distributed to those who worked it. Most of the factories were taken over and run by committees of workers. For the first time in Russian history laws were adopted to guarantee the rights of workers. The code for labor provided for an eight-hour working day, annual paid vacations, social insurance and other benefits.

Before the Revolution three out of every four persons were unable to read or write, and in many of the non-Russian regions there was total illiteracy. In the three years immediately following the Revolution, seven million adults were taught to read and write as the first step of an educational program unparalleled in its aim and scope.

Medical services were made free to every citizen and a network of nurseries, milk kitchens, kindergartens and orphanages were built all through the country.

These and other measures for the general welfare were administered by the local councils, the Soviets of Workers' and Peasants' Deputies, elected by and from the people. From the ranks of the people also developed the organizers and administrators of the new society.

The changes taking place were real and tangible, they could be seen and felt by every worker, every peasant. And the people responded. It was their new way of life they were building, whether they fought at the front or worked behind the lines to produce the food and material the fighting forces needed.

The Subbotnik movement (from the Russian word for Saturday) was one concrete expression of the people's efforts for the good of the country. A group of Moscow railroad workers in the spring of 1919 decided to put

in several additional hours of overtime work on their free day to do locomotive repair work so that supplies could get to the front more quickly. This volunteer movement spread rapidly through the country and embraced millions of workers.

On July 10, 1918, the first Soviet Constitution was adopted at the Fifth All-Russian Congress of Soviets of Workers', Peasants', Soldiers' and Cossacks' Deputies. This historic document phrased the fact that the people were the rulers of the country and these were the laws they had elected to live by.

Peaceful Labor

The war and invasion caused incalculable damage to the economy. From the Baltic to the Pacific the country lay in ruins. The regions which had been held by the enemy were scenes of incredible devastation—flooded mines, wrecked bridges, trampled crops, gutted factories. In the areas from which the enemy had been kept out, production was at a standstill. There was no fuel, no power, no raw materials.

The material cost of the civil war and foreign invasion is estimated at some forty billion gold rubles. By 1920 the country's industrial production was at 14 per cent of the prewar level. Some industries, like iron and steel, had been reduced to their eighteenth century level. The harvest was half that of the prewar years.

Postwar reconstruction was an immense task. For five years after the Civil War ended the nation's every effort was concentrated on rebuilding. Men and women both worked indomitably. By the end of 1923, only 562,000 officers and men remained in the Red Army, the rest had been demobilized to help rebuild the country. The job was done, but with enormous sacrifice. By 1926 the economy of the

country had been restored to the prewar level.

But this was only the beginning of the long pull—to build the backward peasant country into an advanced industrial power. The Communist Party, guided by a program outlined by Lenin, proposed a plan for industrialization based upon development of heavy industry as the only way of building socialism.

The plan presented unbelievable difficulties. First, the country had barely gotten to its feet. It was ringed by a foreign economic blockade. In the Communist Party there were factions headed by Trotsky, Zinoviev and Kamenev that opposed the Leninist program of industrialization. The overwhelming majority of the Communists and the people, however, stood firm in support of the program, regardless of the sacrifices it entailed.

On January 21, 1924, Vladimir Ilyich Lenin died. A grief-stricken people came from every corner of the country to say farewell to their leader. Hundreds of thousands filed past the bier where he lay in state and great crowds waited patiently in the bitter cold winter for their turn to pay a last homage to the man who had spent his great life fighting to build a socialist society.

As a tribute and pledge, 250,000 workers joined Lenin's party. This large enrollment within a brief period of time was further evidence of the people's faith in the Communist Party and in the policy of industrialization it had proposed.

By 1928 the industrial output had risen 32 per cent above the 1923 figure, a remarkable advance for so underdeveloped a country. But this was only the first long step. In 1928 the first of the Five-Year Plans was drafted to accelerate the rate of industrial progress by socialist planning of the entire economy.

A United Socialist State

"The Declaration of the Rights of the Peoples of Russia," one of the early govern-

ment decrees after the October Revolution, had proclaimed the equality and sovereignty of all national groups inhabiting the country, their right to self-determination and the abrogation of all national and religious discrimination.

Millions of formerly downtrodden and disfranchised people thus became equal citizens of the new multinational state. The peoples of the Ukraine, Byelorussia, Kazakhstan and other parts of the country set up their own Soviet Socialist Republics.

This did not, by any means, signify secession from Russia. The old enforced unity which, in Lenin's words, rested on falsehood and iron, was abolished forever. It was replaced by a voluntary unity, a unity of free peoples, which had emerged out of the intervention and had been strengthened by the common defense against the foreign invaders.

Fighting together in the Red Army had been Russians and Ukrainians, Georgians and Armenians, Azerbaijanians and Uzbeks, Byelorussians and Latvians, Lithuanians and Estonians, Tatars and Bashkirians—all the people of Russia liberated from national and social oppression. To fight separately would have been to perish, this everyone had learned.

The danger of attack did not end with the Civil War. The threat was ever-present and the need for united effort even more pressing. Only by acting in concert could the republics recover from the war's damage and grow strong.

Early in 1922 representatives of Azerbaijan, the Ukraine and some other republics pro-

posed a union of states. The proposal was widely discussed and enthusiastically welcomed by every one of the republics. At the First All-Union Congress of Soviets, 2,214 delegates elected by the republics convened in Moscow and on December 30, 1922, they voted to form the Union of Soviet Socialist Republics.

Thus the Soviet republics merged into a single multinational state, united upon the principle of equality and fraternal cooperation.

Thirty-six years have passed and this unity, tested by trials and difficulties, stands firm and unshaken. At present the Soviet Union is made up of fifteen Soviet Socialist Republics.

Soviet People Work for Peace

In the very first days after the October Revolution, the new state declared itself for peaceful coexistence with all nations. After the Civil War and the routing of the interventionists, diplomatic and trade relations with foreign countries were gradually normalized. By the end of the reconstruction period Britain, France, Germany, Italy, China and Japan had formally recognized the Soviet Union.

The Soviet Union, then as now, was firm in its conviction that states with different social and political systems could live together peacefully. Let us work toward mutually beneficial trade and cultural exchange. This was the essence of the proposal it submitted to the Genoa conference of 1922, the first international conference in which the Soviet state participated. Concerned with reducing tensions between states, the Soviet delegation also

presented a proposal on disarmament. It was turned down by the Western Powers without even an attempt at discussion.

There was no lack of evidence to prove the point that their intent was to harass the socialist state. Two Soviet ambassadors abroad, Vorovsky and Voikov, were assassinated. The Soviet embassies were repeatedly subjected to police raids. The Soviet Government was presented with ultimatums—the Curzon ultimatum of unhappy memory in 1923 and the Chamberlain Note in 1927. Documents were forged to discredit the Soviet Union and the senseless accusation made that it was responsible for the rise of the national liberation movements in India and other colonial countries.

It was under these very trying conditions that the Soviet Union steadfastly and persistently worked toward peaceful relations with all states.

Recovered from the Civil War, the country moved forward rapidly. By 1941, the time of the Nazi attack, the Five-Year Plans had brought the Soviet Union to second place in the world in industrial output and it had achieved for its people a standard of living immeasurably higher than they had ever experienced.

The Five-Year Plans for the development of the national economy, carried out prior to and since the war, were logical preludes to the sweeping seven-year plan for 1959-1965 just drafted, another stage in the country's development toward a standard of living higher than any the world has yet seen.

LENIN DEDICATING THE FIRST RURAL POWER STATION IN THE VILLAGE OF KASHINO. ELECTRIFICATION PLAYED A MAJOR ROLE IN THE COUNTRY'S ECONOMIC PLANS.



THE USSR ACADEMY

By **NORAIR SISAQYAN**
*Assistant Chief Academic Secretary,
Presidium of the USSR Academy of Sciences*

IN ONE OF THE LABORATORIES OF THE ACADEMY'S POWER INSTITUTE.

THE quantity and quality of research in mathematics, mechanics, physics, chemistry, biology, electronics, automation and in the many other fields of science and technology go far to explain the rapid rate of Soviet economic growth. This has been true ever since the first five-year plan for the country's development was drafted in the late twenties. It is immeasurably truer today when scientific personnel and equipment are available in infinitely larger quantities.

The present seven-year plan for 1959-1965 outlines what is unquestionably the most all-embracing quest for scientific knowledge ever to be undertaken, whether in terms of funds to be spent, people to be trained or research facilities to be built.

The USSR Academy of Sciences is the country's central headquarters for research in all fields of study. It is not merely an honorific learned body. It supervises a widely branching number of scientific institutions, unifies and coordinates research, and lays out new areas for investigation.

In the past forty years the number of institutes, laboratories and experimental stations guided by the Academy has grown fivefold, the number of its scientists 230 times over and the funds budgeted to the Academy by the government have increased by 800 times.

Pre-Soviet Russia had a total of 10,200 trained scientists. By the prewar year 1940 the number had grown to 98,300. Today there are more than 270,000 men and women carrying on research in industrial and agricultural enterprises, in scientific institutions, in colleges and universities. They have all possibilities for putting the most daring ideas into practice, and their creative work is an important contribution to the efforts of the entire nation in shaping the future of the country.

Significant, too, is the change in the research scientists themselves. Now they are, for the most part, sons and daughters of workers and farmers educated in a socialist environment. They consider their studies not only as laboratory problems but also in terms of their social utility. Many of these scientists belong to national groups who for centuries were denied even an elementary education, let alone access to the large body of knowledge required for scientific research.

Structure of the Academy

The highest authority in the USSR Academy of Sciences is the general membership meeting. The membership elects the permanent Presidium which functions between meetings. The Academy has eight divisions each covering a specific field of study:

- physics and mathematics;
- the chemical sciences;
- geology and geography;
- the biological sciences;
- the technical sciences;
- history;
- economics, philosophy and law;
- literature and linguistics.

Each division directs the work of the institutes conducting research in its field and besides has under its jurisdiction independent laboratories, experimental stations, museums and libraries. The area of activity of the division is very extensive both with regard to allocation of funds and personnel and in organizing research. Projects for investigation are initially considered by the division membership. If approved, they are recommended to the Presidium of the Academy for authorization.

Guiding the work of each division is its own board elected by the membership. Directors of the institutes and laboratories are elected by the Academy's general membership meeting.

Ranking with the divisions is the Academy's Council for Study of the Productive Forces. With the help of the institutes and local Academy branches the Council organizes research work in different parts of the

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country. It has been responsible for the discovery of many rich mineral deposits.

The Academy has its own publishing house for monographs, journals and books. The volume of publications issued has increased six times over since the prewar years. In one year now the Academy puts out about 1,000 monographs and books and some 600 issues of scientific magazines. The Academy publishes 74 journals, and most of them are issued in translation in foreign countries.

Besides the USSR Academy publications, there is a growing body of literature issued by the Academies of the Union Republics and other scientific institutions of the country.

The institutes of the USSR Academy are centered mainly in Moscow although there are many research centers and experimental stations in widely distant parts of the country. The network of scientific institutions outside the capital has been rapidly expanding in recent years.

There is, for instance, the Siberian Branch of the Academy, set up in 1957 in Novosibirsk, which now has a widespread group of its own regional research institutes. This new scientific center is studying the vast natural wealth and productive possibilities of a territory that extends from the Ural Mountains to the Pacific Ocean.

Academy branches have been established in different zones of the country. They give major attention to natural resources study, with each branch specializing in one or another field. Thus, the Bashkirian Branch concentrates on oil geology and chemistry and the Kazan Branch, in Tataria, on the chemistry of phosphoro-organic compounds. Many branches are also doing theoretical research in natural and technical sciences and in the humanities.

Academies in the Union Republics

Most of the Academies that exist now in the Union Republics grew out of branch centers of the USSR Academy. The Kazakh Academy of Sciences is a good example. It was set up originally in 1932 as a small scientific station with a staff of only eleven botanists, zoologists and chemists. As Kazakhstan's economy developed, education spread and

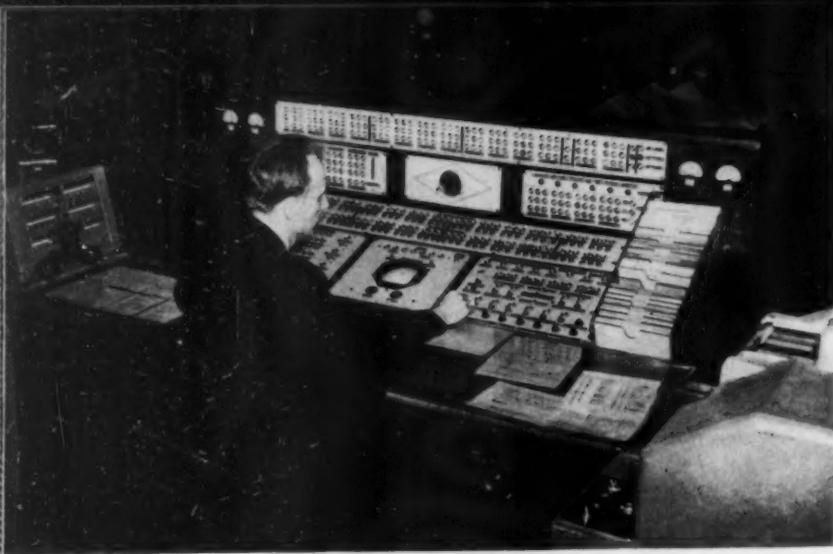


The Academy's staff personnel is among the total of 270,000 scientists of the country engaged in research.

The Presidium of the USSR Academy of Sciences has its offices here.

ALEXANDER NESMEYANOV, PRESIDENT OF THE ACADEMY (LEFT), AND HIS COLLEAGUES.





CONTROL BOARD OF A GENERAL PURPOSE ELECTRONIC COMPUTER AT THE ACADEMY.

THE USSR ACADEMY OF SCIENCES

native scientists were trained, the staff of this local research center expanded to include specialists in geology, soil science, genetics, geography, history, linguistics and other fields.

In 1938 the Kazakh Branch of the USSR Academy was founded. It united 16 specialized research institutes, 50 laboratories, a botanical garden and several other scientific centers. In 1946 this Branch, with thousands of scientists conducting investigations into most varied fields of study, was reorganized to become the Academy of Sciences of the Kazakh Republic.

Specialized Research Centers

Besides the USSR Academy and the republican academies, there are specialized academies—in the fields of agriculture, medicine, education, and architecture and construction. The structure of both the specialized and republican academies duplicates that of the USSR Academy of Sciences.

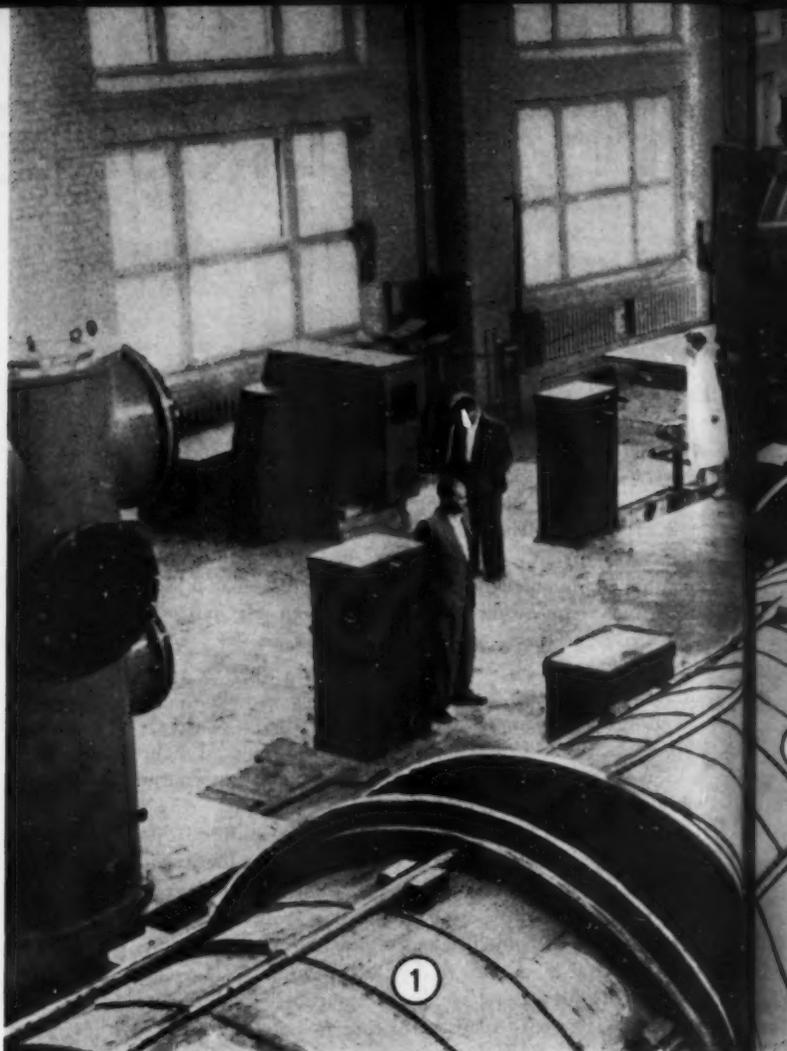
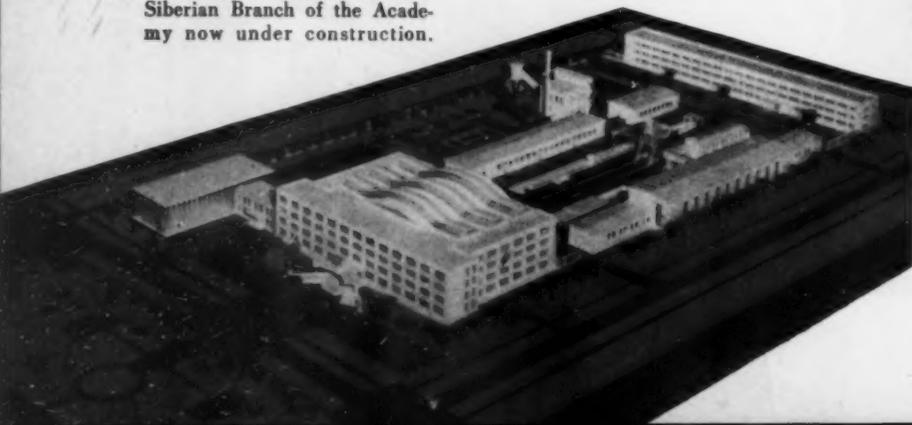
The national system of scientific institutions also includes a large group of research centers attached to various industries and some to divisions of an industry. Typical is the Nonferrous Metals Research Institute. There are similar institutes in the food industries, aircraft construction, transport, and many other fields of national endeavor.

There are, besides, a large number of laboratories in the colleges and universities where research most basic to the country's scientific, economic and cultural progress goes on unceasingly. More and more of this investigation is being coordinated with the work of the USSR Academy and the Academies of the Union Republics.

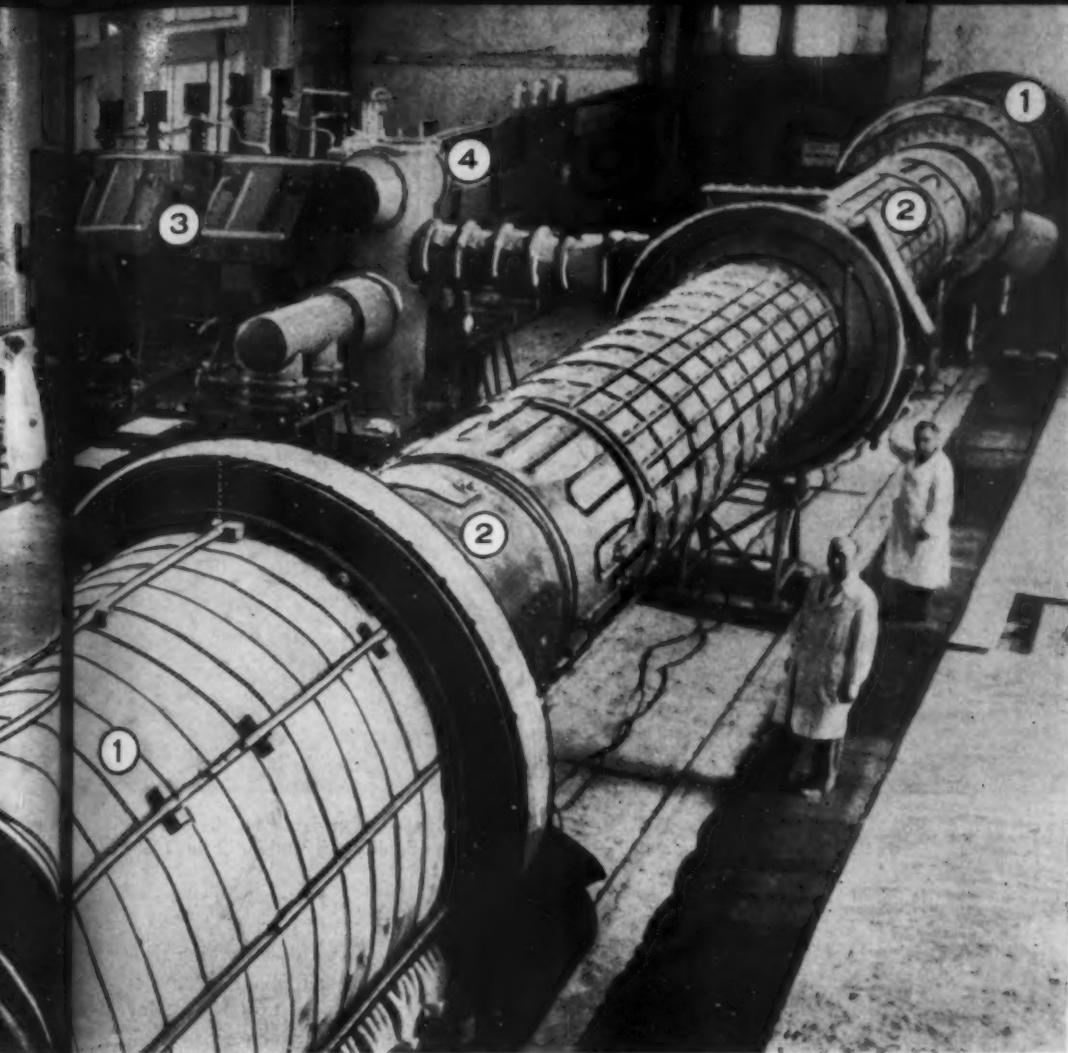
Planning Research

Soviet scientists think of their work as an interrelated segment of the country's economic and cultural life. Theoretical research programs

The scale model shows one of the research institutes of the Siberian Branch of the Academy now under construction.



Mikhail Lavrentyev, director of the Academy's Siberian Branch at Novosibirsk, is a noted mathematician and aerohydrodynamics researcher.



Soviet scientists are working continually on research in the peaceful uses of atomic energy. One part of this research is being done at the Atomic Energy Institute of the USSR Academy of Sciences on the *Ogra* installation. It was designed and built under the direction of Professor Igor Golovin, 1958 Lenin Prize winner. The figures in this photograph show:

- 1—solenoids;
- 2—vacuum chambers;
- 3—injector;
- 4—power source of injector.

are therefore closely tied in with the current seven-year plan and with the plans for the years to come after that.

In working out its long-range research goals the USSR Academy of Sciences calls on the most eminent specialists in each field to outline major problem areas and chart the major directions for investigation. Long-range plans for specific scientific problems, and then for whole fields of study, are coordinated into the Academy's over-all plan for research. After approval by the USSR Council of Ministers, this plan is allocated budgetary funds in the amounts required to finance the research projects of all the Academy's institutions.

Research in many fields is planned with the cooperation of staff members of scientific institutions outside the Academy, and of scientists at colleges and universities. Ever increasing contributions are made by specialists working in industry, agriculture and other branches of the country's economy. Scientific councils and commissions on specific problems direct all kinds of research on a national scale. Conferences convened to discuss the results of the investigations in each of these problems are becoming an important means of coordinating the work done by different groups and are promoting closer contact between scientists.

This type of integrated planning has proved to be by far the most effective way of relating scientific research to national needs, both present and future. Personnel and equipment can thus be more heavily concentrated on the most pressingly important problems, whether theoretical or applied.

Cooperative Research

It has become regular practice in the Soviet Union for groups made up of researchers in different fields to work together on the solution of scientific problems. Such major projects as the unified hydroelectric development of the Volga River, the construction of atomic power plants or the development of the space research rockets were all worked out collectively.

An over-all approach to a problem of large scope is particularly necessary in modern research because of the increasing specialization which

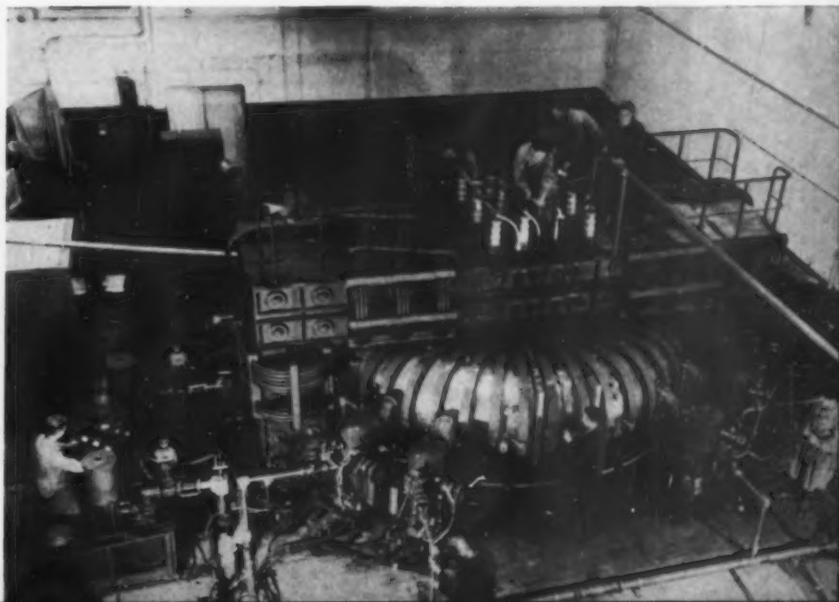
advancing knowledge makes necessary on the one hand, and the overlapping of these specialties on the other.

Close contact is maintained by the USSR Academy with the academies of the various republics in order to ensure this type of coordinated investigation and pooling of knowledge. The same close contact is maintained with the colleges and universities. This is facilitated by the fact that most Academy members teach at one or another school.

"Pure" and Applied Science

The old distinction between "pure" and applied science has long ceased to have any real working significance except as convenient terms for classification. That is sufficiently evident if one brings to mind the

SETTING UP A TEST ON THE ALPHA, A NEW SOVIET ATOMIC RESEARCH ASSEMBLY.





Alexander Mikulin (left), a pioneer designer of Soviet aircraft engines and one of the first scientists to employ gas turbines, confers with Boris Stechkin, founder of the theory of air-jet engines.



Pyotr Kapitsa won fame by discovering the super-fluidity of Helium 2 in 1938.

THE USSR ACADEMY OF SCIENCES

very practical developments which have resulted from theoretical studies in the structure of the atom. Or consider the infinite number of theoretical studies involved in the construction and launching of the space rockets, the basic investigations in many sciences in their overlapping relations that were required.

In the mathematical sciences, basic studies in calculus are responsible for the very practical developments in automation engineering and electronics. Theoretical studies in chemistry have made possible the synthetic materials which we now weave into the clothes we wear and process into thousands of articles for daily use. One can cite such examples in every field of study.

Credit for high-yielding Soviet wheat varieties goes to Nikolai Tsitsin who is now working on remote plant hybridization.



Over-all planning of scientific research permits a closer working relationship in overlapping scientific areas. The newer findings in physics and chemistry, for example, are vitally important to such present-day studies in biology as the use of nuclear radiation to produce new varieties of cultivated plants. Researchers in biochemistry, biophysics, agrochemistry, microbiology, genetics and other interrelated fields are working on hundreds of studies which cross over from one science to another.

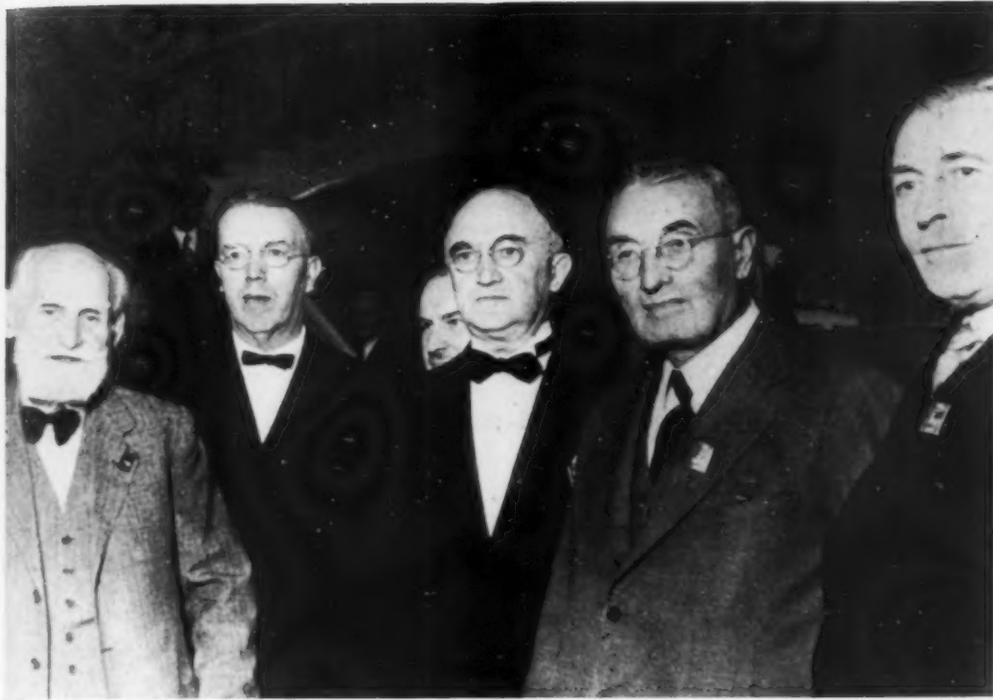
All these considerations—the present needs of the country as envisioned by the current economic plan, the major research directions, the groundwork studies for future development, the training of tomorrow's scientists—enter into the national plan for research developed by the USSR Academy of Sciences.

Academicians

Academician is the most distinguished title a Soviet scientist can be awarded. Members of the Academy are elected by secret ballot at the

Academy Vice-President Ivan Bardin, iron and steel specialist, won a 1958 Lenin Prize for working out a commercial continuous steel-pouring installation.





International contacts of Soviet scientists run back many years. This 1934 photo from the International Physiological Congress held in Moscow shows the famous Academician Ivan Pavlov (at the left) with some of his American colleagues at a session.

Soviet Academicians K. Ostrovityanov and V. Vinogradov; A. Mason (France); M. Fasner (West Germany); A. Belic (Yugoslavia); B. Gavranek (Czechoslovakia) at the International Congress of Slavists in Moscow.

general membership meetings. They are men and women who have made major contributions in their fields of study.

Announcements of Academy vacancies to be filled are published in the press at least two months before the membership meeting at which elections are held. Scientific institutions and public organizations at that time nominate the most eminent of their workers for membership.

Commissions are then elected by each division of the Academy to consider the nominees and evaluate the contributions they have made to studies in their fields. Each commission reports its conclusions to a full meeting of the division. Candidates approved by the division are then recommended for election to the Academy at its general meeting.

The USSR Academy of Sciences has at present 167 members and 361 corresponding members. In 1957 25 new members and 54 corresponding members were elected from a large group of nominees.

At one of the last general meetings of the Academy 32 eminent scientists—American, British, French, Swedish, Belgian, Japanese, Italian, Polish, Indian and those from other countries—were elected to membership. The American Academicians are Dr. Detlev Bronk, President of the



Professor E. E. Salpeter of Cornell University addressing a seminar at the Nuclear Research Institute in Dubna. His audience included a number of outstanding foreign scientists as well as many Soviet experts.

THE USSR ACADEMY OF SCIENCES

United States National Academy of Sciences, and Nobel Prize winner Dr. Linus Pauling.

Exchanges With Foreign Scientists

The USSR Academy of Sciences spares no effort in establishing the closest scientific contact with scientists abroad for the exchange of ideas and comparison of approaches so necessary for progress in any field of study.

Exchanges of scientific monographs and journals are supplemented by papers read at international scientific congresses. Soviet scientists keep their laboratory doors wide open for visiting foreign scientists and welcome invitations from their colleagues in other countries.

As compared with the previous period, three times as many Academy members have visited abroad in the past three years and a far larger number of foreign scientists have visited the Academy laboratories and institutes. Many foreign scientists attend the frequent international scientific conferences convened in the Soviet Union.

Academy scientists have lectured in the United States, Britain, France, Belgium, Italy, China, Poland, India and other countries. In turn scientists from many foreign countries including the United States have read lectures in the Soviet Union in these past years.

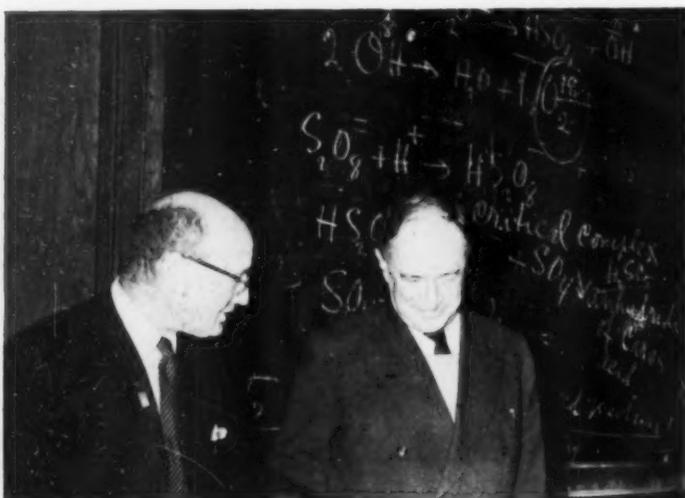
Many hundreds of foreign scientists are now working in laboratories of the Academy on joint researches. In exchange, Soviet scientists are working in research institutions in Britain, France, India, Denmark, China, the United Arab Republic and elsewhere. Foreign students in large numbers are doing graduate study and research in Academy institutes.

A new and promising development in international scientific contact is represented by the agreements on research cooperation concluded between the USSR Academy and the academies of other countries. Many endeavors have been carried through by joint work of Chinese, Polish, Czechoslovak and Soviet scientists. Reciprocal exchanges of scientists and lecturers between the USSR Academy and the British Royal Society have also developed out of this kind of agreement, as well as broader scientific contact between French and Soviet researchers.

Still greater extension of international exchanges is essential in the interests of scientific progress. New sources of ideas and theories are born of constant contact between the scholars of the world.

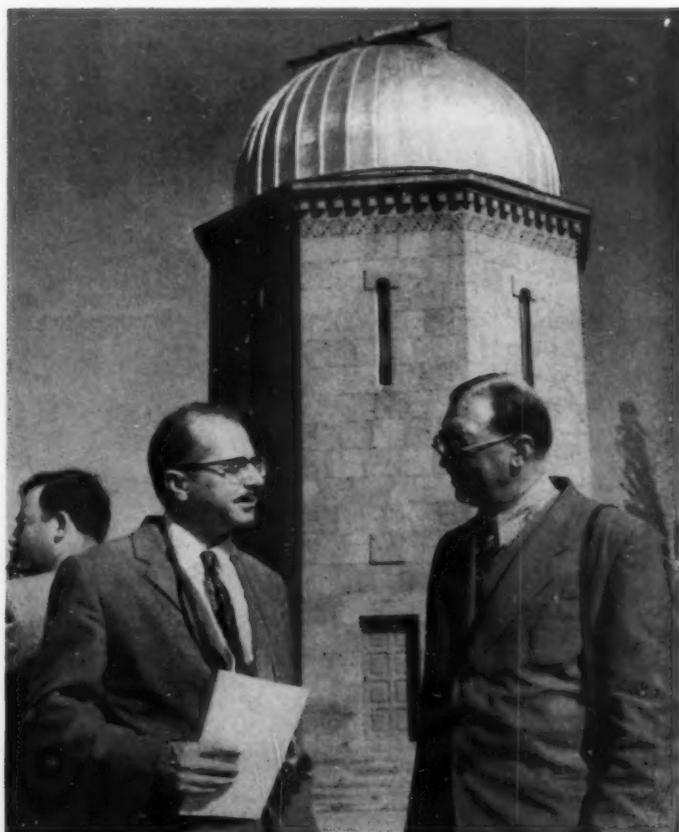


U.S. Nobel prize winner Linus Pauling, Soviet biochemist Alexander Oparin, Prof. Wendell Stanley of California and Prof. Sidney W. Fox of Ames, Iowa.



Soviet Academician Alexander Frumkin (right) is shown here with Prof. Isaac M. Kolthoff of the School of Chemistry of the University of Minnesota.

Many delegations of foreign scientists visit the various institutes of the Soviet Academy annually to review the advances in their own fields.



Dr. Jesse Greenstein (left) of California's Mt. Wilson Observatory and Prof. Boris Vorontsov-Volyaminov at Byurakan Observatory in Armenia.



Soviet and American scientists meet to draft their agreement on exchanges of information and lecturers during 1959-1960. Final approval of the program is to be made by the two Academy boards.



Professor Pasynsky of the Biochemistry Institute (at the right) greets Dr. Detlev Bronk.

President of the U.S. National Academy of Sciences Meets Soviet Scientists

DR. DETLEV W. BRONK, president of the National Academy of Sciences in Washington and the Rockefeller Institute for Medical Research in New York, visited the Soviet Union at the end of last year at the invitation of the USSR Academy of Sciences. He arrived in Moscow accompanied by Dr. Wallace Brode, associate director of the National Bureau of Standards and also a member of the U.S. National Academy of Sciences.

During the conferences in Moscow, the American scientists met with their Soviet colleagues Alexander Nesmeyanov, president of the USSR Academy of Sciences, Alexander Topchiev, its vice-president, and Academician Vladimir Engelhardt.

The talks, which progressed in an atmosphere of friendship and full understanding, were devoted to spelling out the details of a draft agreement on scientific exchange between the two countries. The protocol which was signed calls for the draft to be delivered to the boards of the two Academies for final consideration.

The draft envisions an exchange of scientists in 1959 and 1960 between the USSR Academy of Sciences and the U.S. National Academy of Sciences to read lectures and conduct seminars on various problems of science and technology. It also provides for mutual information on scientific research work in both countries.

Referring to his conferences with Soviet scientists, Dr. Bronk said: "The talks have been very satisfactory and have been conducted on a very friendly basis. The general proposals which I shall take back to the Council of the National Academy of Sciences will, I am sure, be of great benefit to our two countries, because we have a common interest in furthering the welfare of mankind."



Dr. Detlev Bronk (second from right) in a laboratory of the Moscow Neurosurgery Institute of the USSR Academy of Medical Sciences.

Dr. Detlev Bronk confers with Academician Vladimir Engelhardt (at the left) in the Biochemistry Institute of the USSR Academy of Sciences.





PYOTR TURCHINSKY, ASSISTANT DOCTOR AT THE HOSPITAL, PLAYS THE COUNSELOR TO THE SULTAN SELIKH-AGA.

VASILY CHURAYEV IS AS GOOD AT ALGEBRA AS HE IS IN HIS BLACKAMOOR ROLE.



Workers' Club Stages an Opera

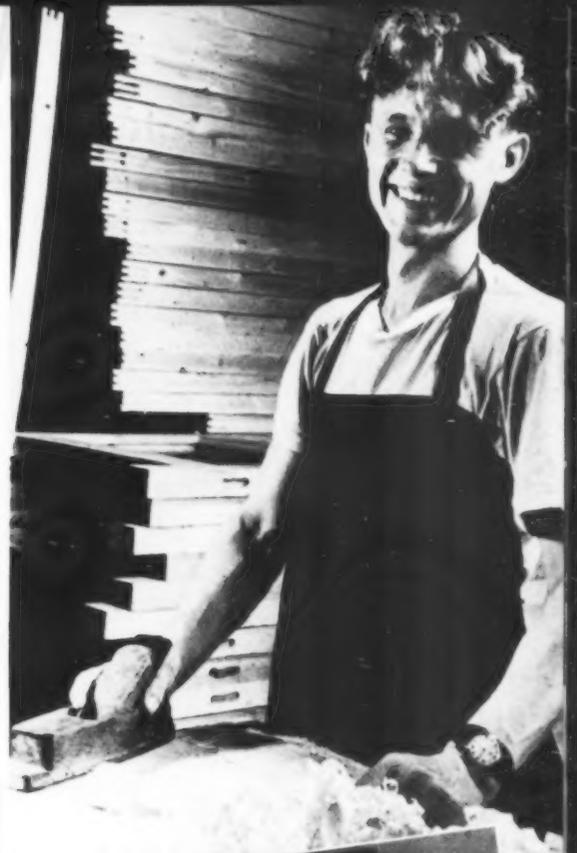
By Boris Yurin

PLASTERED all over the billboards around the neighborhood of the Stalin Water Pumping Station near Moscow some months ago were placards announcing a new production of the opera *The Zaporozhets Beyond the Danube* by the Ukrainian composer Semyon Gulak-Artemovsky.

This was a somewhat unusual production. The leading part, Zaporozhye Cossack Ivan Karas, was played by an electrician who works at the station, Boris Khmelniitsky. Mechanic Anatoli Aksyonov sang the part of Andrei Nechai, another leading role in the opera. The main women's parts, Karas' wife Odarka and their adopted daughter Oksana, were rendered by two friends, Valya Lavrentyeva and Tonya Morozova.

Carpenter Yuri Kozyrev played the part of the Old Man and, incidentally, made the sabers and lances which the Cossacks carried. Artist Vladimir Bykov, who lives in the neighborhood, designed the costumes and scenery. Boris Skaryatin, who works in the station's experimental shop, did the lighting.

All-told some 85 neighborhood people took part in the opera. It was staged at the water pumping station workers' club and grew out of the chorus, one of the older and very popular plant activities. The club has long had its own band, string orchestra, dance ensemble and dramatic studio. So that all the basic ingredients were available when the idea of staging an opera cropped up at one of the chorus rehearsals.



Carpenter Yuri Kozyrev who plays a bit part in the opera built most of the sets and props.



Secretary Tonya Morozova plays the part of Oksana, one of the main roles.

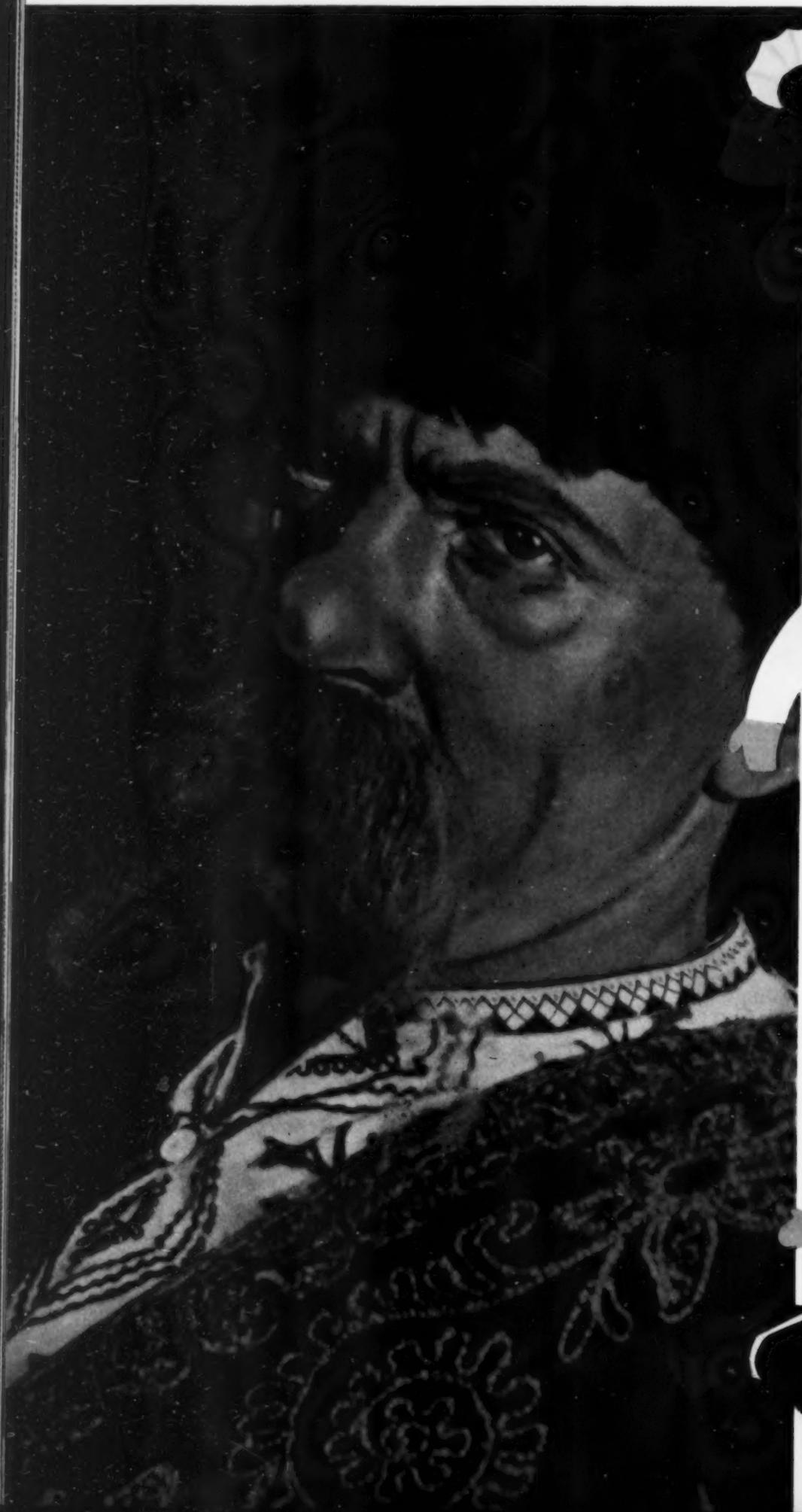


Store clerk Irina Ostrikova speaks individually to buyers but sings in the opera's mass chorus.



Workers' Club Stages an Opera

THE LEAD PART OF IVAN KARAS, A ZAPOROZHYE COSSACK, IS SUNG BY ELECTRICIAN BORIS KHMELNITSKY.





VALYA LAVRENTYEVA (LEFT) AND TONYA MOROZOVA SINGING THEIR DUET.

THE CLERK PROKOP (STUDENT SASHA OSIN) IS BRIBED BY THE COUNSELOR.

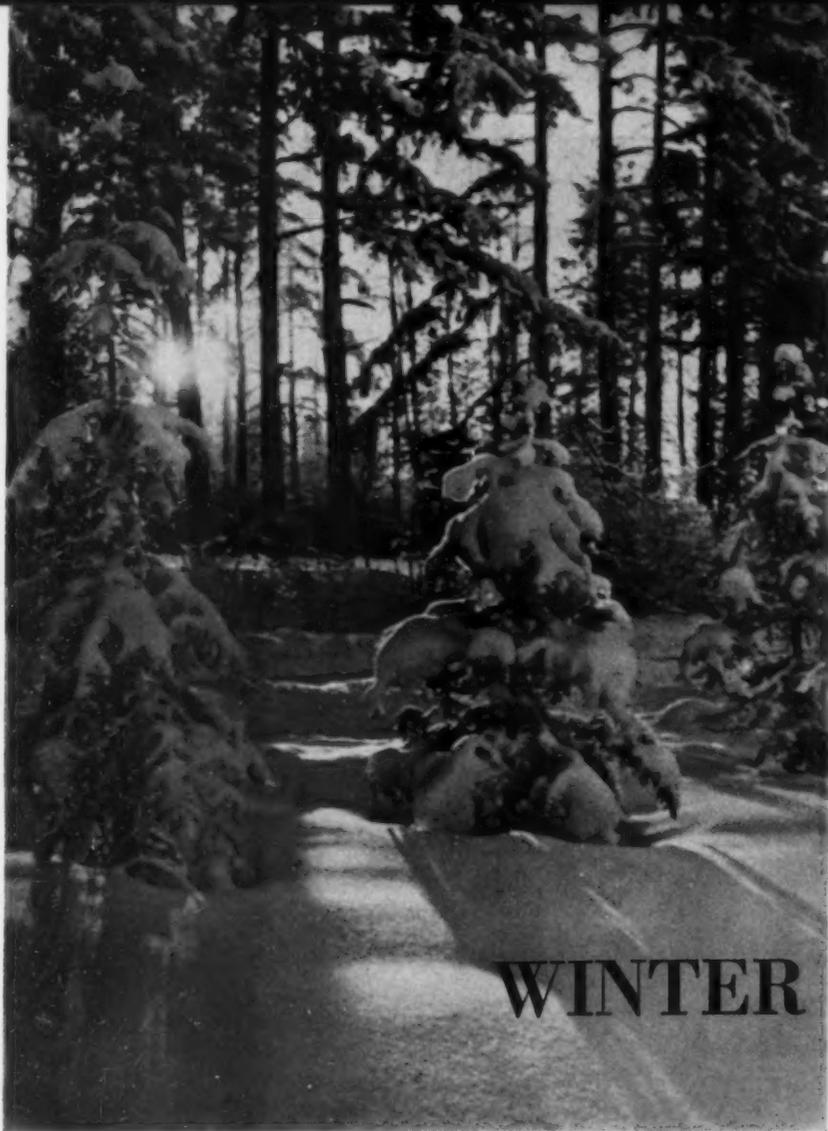


SCENE FROM THE LAST ACT OF THE OPERA WHICH HAD A CAST OF 85 AMATEURS.

The Zaporozhets Beyond the Danube was chosen because it is light, gay opera. Its Ukrainian songs and dances, everyone felt, would have a wide appeal. And so it did. A minute after the overture ended and the curtain went up on Cossack Ivan Karas cavorting on the stage—Ivan has been out on a spree and he's dancing merrily down the road—the audience was won over thoroughly and completely.

All the talent was local. The singers, dancers and musicians worked over the libretto and score, built the sets and the stage props. The cost of the whole production was a modest 2,800 rubles which mostly went to pay for hired costumes. The money was contributed by the trade union organization at the water pumping station.

Mikhail Nakhimovsky, teacher of music at the neighborhood school, conducted the club's amateur orchestra with genuine artistry. The leads and the chorus all did a superb job and the folk dancing was superlative. On this everyone was agreed. The judgments, say the singers, musicians and stagehands, are perhaps a little partisan but if the audience had half as much fun as they did, it must have been a pretty good production.



WINTER is a Gala Season

ALTHOUGH February finds winter far advanced in the Soviet land, there is much more to come. The decorated fir trees are still up in city squares and village centers, bringing back memories of the gay New Year's festivities and parties.

Parks and stadiums are crowded and lively spots. There are many more contests ahead for the ice hockey teams of the various leagues before the titles are won. The theater season is now in full swing, and many new exhibits have opened in galleries and museums.

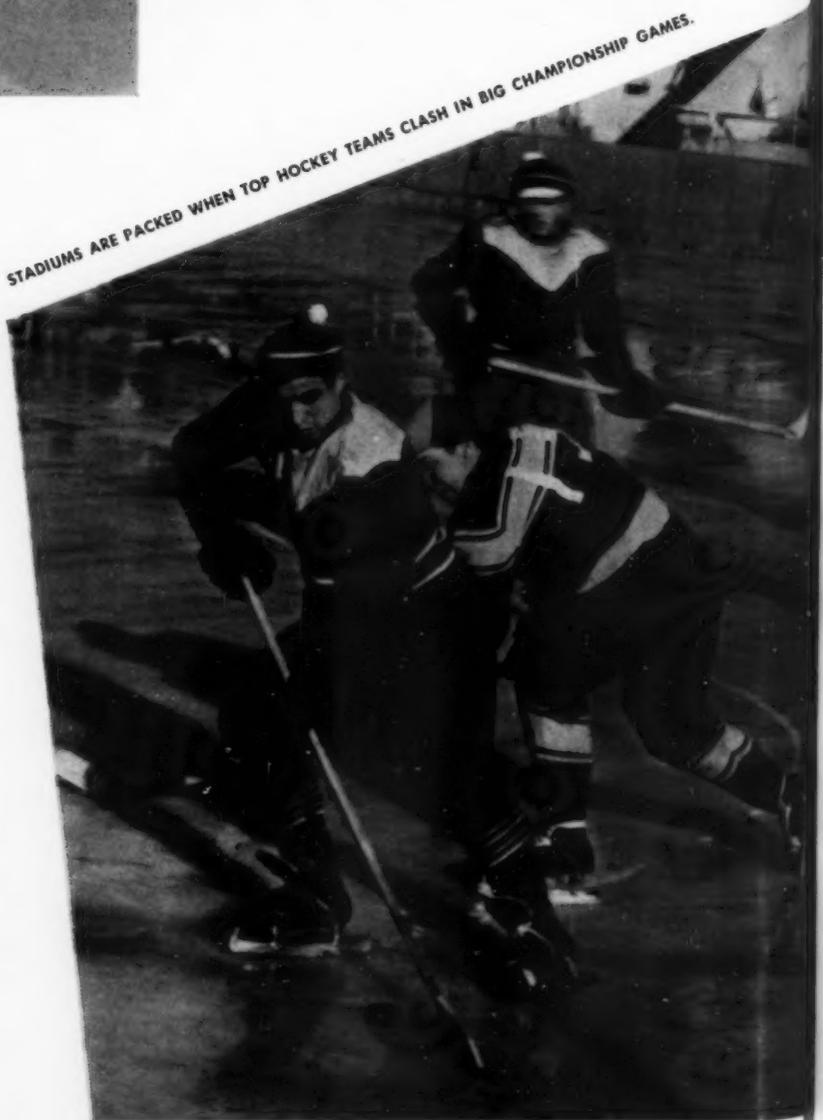
Ice skaters crowd the rinks everywhere and the ski-trails are filled to capacity with sports-minded men and women bound for a weekend in the open.

Wintertime is extremely popular with everybody in the country, and young and old unite in their support of the old proverb, "Russian cold is good for the Russians' health."

FRESHLY FALLEN SNOW LURES SMALL FRY WITH SLEDS OUT-OF-DOORS.



STADIUMS ARE PACKED WHEN TOP HOCKEY TEAMS CLASH IN BIG CHAMPIONSHIP GAMES.





CONFIRMED SWIMMERS WON'T LET WINTER'S CHILL HALT A FAVORITE VICE.
IT'S NOT A BIT HARD COMING DOWN A SKI TRAIL PROVIDING YOU KNOW HOW . . .



. . . IT'S CLIMBING UP THAT'S TEDIOUS.

Students on Vacation

VACATIONS for the elementary and high school set came to an end January 11, but the youngsters still reflect on the fun. College and university students, however, have their winter holidays late in January and early in February.

Lecture halls and libraries are emptied for two weeks. The anxious moments of examinations are replaced with exciting plans for hikes and excursions, visits to concerts and museums. Carni-



THERE'S PLENTY OF TIME DURING THE HOLIDAYS FOR GOSSIPING, AND THESE TWO AREN'T WASTING A MINUTE.



Putting on an act is great fun for the youngsters, and they do it rather well.

vals and sports contests are widespread attractions.

It is a season for gaiety and mirth—of reunions with one's family and old friends. But this is also a time for making new friends. Inter-city exchanges of student groups bring the young people of the big country closer. All in all, winter vacation is one of the loveliest times of the year.

Special performances are scheduled by the theaters. Ski-stations, skating rinks, gymnasiums and indoor swimming pools are all at the disposal of the college set.

Dances and parties are a regular thing at this time for collegians. They include big costume and dress balls as well as smaller affairs.

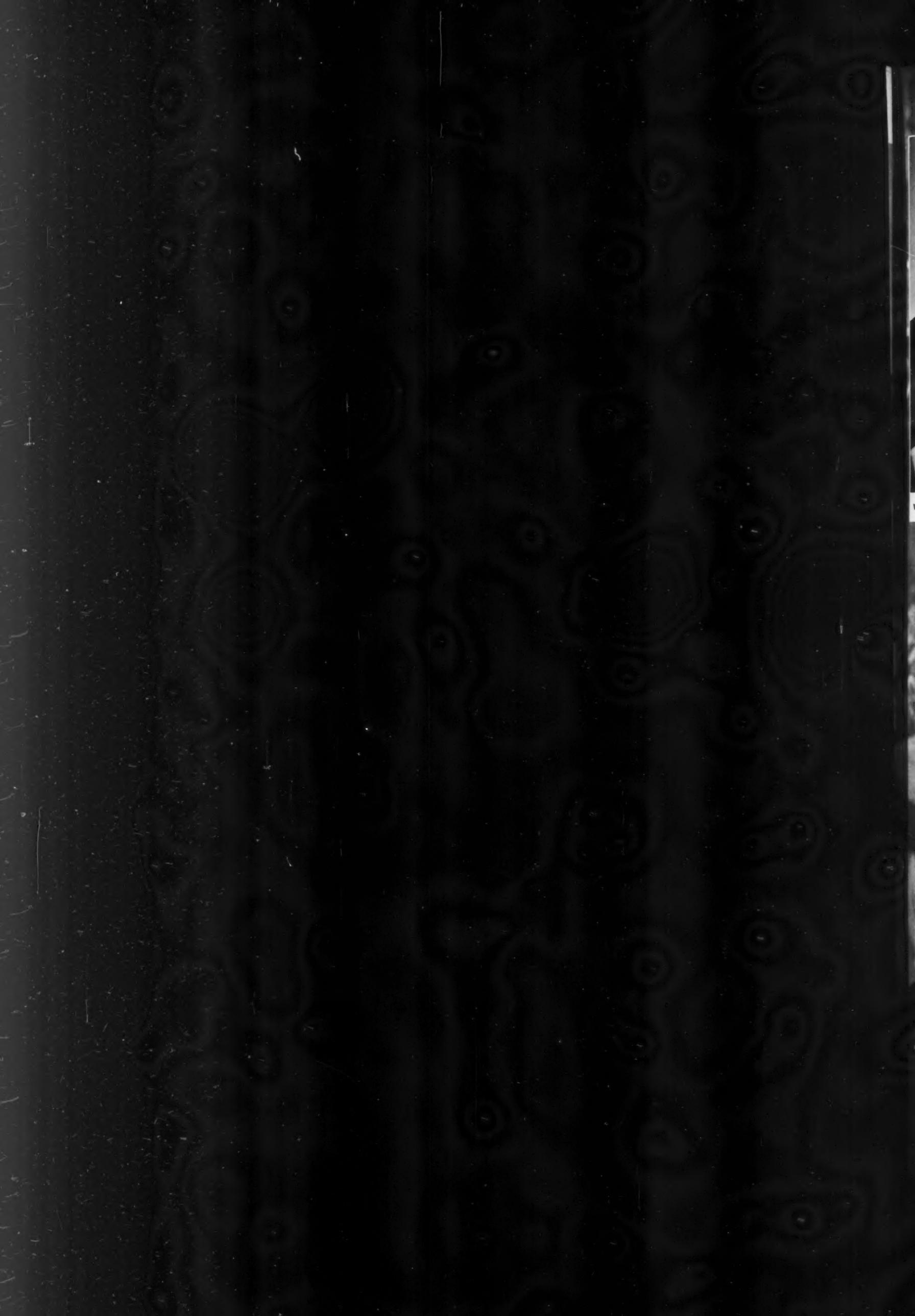
During these festive occasions the students themselves put on skits and a variety of amateur performances. College basketball and hockey teams schedule all kinds of competitions for the holiday period, and fans turn out in great numbers to back their stars.

The fortnight's holiday seems all too brief for the students, but when it ends they return to their classrooms ready to settle down to serious work again.



Technical exhibits help our space-age juveniles keep up their zest to learn.







WHEREVER STUDENTS GATHER, YOU'LL FIND THEM SINGING GAY COLLEGE TUNES OR SOME LYRICAL FOLK SONGS.



NATURALLY FOND OF MERRYMAKING, STUDENTS PRESENT MANY FUNNY SKITS.



A HOPEFUL YOUNG BACHELOR WAS AWARDED A CHILD'S ROCKET AUTOMOBILE.





COSTUMED GROUPS OF GAY YOUNG FOLKS ENTERTAIN THE HOLIDAY CROWDS.

THE JOVIAL MOOD OF THE SEASON PUTS GROWNUPS ON SLEDS AGAIN.



SCULPTORS EMPLOY SNOW AND ICE TO DRESS UP CHILDREN'S SLIDES IN PARKWAYS.

THE COURTYARDS OF LARGE APARTMENT HOUSE PROJECTS MAKE GOOD SKATING RINKS.





CHILDREN IN THE VILLAGES HAVE QUITE AS MUCH FUN IN THE SNOW AS THEIR CITY COUSINS.



SKATING WITH YOUR BEST GIRL OR BEAU IS A SPORT THAT INTERESTS STUDENTS OF ALL AGES.



CAMPING HAS ITS TRYING MOMENTS, BUT THEY SEEM TO LIKE IT.

Holiday of the Russian Winter

THERE are many old traditional folk holidays celebrated in each of the Soviet Republics. One of the gayest in the Russian Federation comes with February. Known as the "Holiday of the Russian Winter," it features great mass festivities in a general carnival-like atmosphere.

The merrymakers carry horns and other noisemakers. Colored balloons bob in the chill winter air. In the parks colorful booths provide hot pancakes and doughnuts, meat dumplings and other goodies that are downed with hot tea.

Ice skaters and skiers throng the parks. The younger celebrants crowd aboard the sleds on a winter merry-go-round, ride on a sleigh train pulled about the grounds or take an exciting trip on a troika, a traditional Russian three-horse sleigh.

Toboggan teams run down prepared raceways, while in the suburban areas and in villages, autos and motorcycles pull strings of sleds with tinkling bells over the hard snow. Races by dog sled teams or harnessed reindeer provide more fun for both participants and spectators in this merry holiday whose history goes so far back into the past.





Photos by Igor Vinogradov and Adolph Antonov

IT IS both difficult and easy to comply with the USSR editors' request to tell what's been happening to me since I completed my army service. Difficult—because I don't often pick up a pen to write, and besides, writing about myself for a magazine is something entirely new. Easy—because quite a few changes indeed have taken place in my life since I returned home from the army. I mean, I have something to say, but before I do, I would like to mention a few words about my army experience. After all, I served 1,000 days in uniform. . . .

Changes in My Life

Since I Completed My Army Service

By Boris Muratov

BACK TO CIVILIAN LIFE



... This picture is very dear to me. It was taken shortly before I returned home. You see me (on the left) with my buddies, Pyotr Krasnov (center) and Ivan Fyodorov. The following day we boarded trains and were on our way home—Pyotr to Saratov, Ivan to Rostov-on-Don, and I to Moscow. We had become close friends in our three years of service, sharing the difficulties and joys of army life. At first we were homesick, but we gradually got over it. We tried to adjust to our new professions as quickly and as well as possible. I received training as a radio technician. One gains tremendous practical experience in the army. A fellow has a wonderful chance to discover his talents, develop his aptitudes and test his abilities during his period of service. . . .



... The day finally came when I returned to civilian life. First I had to find a job I liked. At the district military office where I registered after demobilization as a reserve private, some men in civilian clothes came up to me. They were representatives of Moscow factories and offered me, like all other demobilized soldiers, jobs at their respective enterprises. I liked the offer of the Electric Bulb Factory best and started work there. The first thing a recruit does when he joins the army is to put on a soldier's uniform. The procedure upon returning to civilian life is just the opposite: he puts on a civilian suit. I bought one I liked in a ready-to-wear clothing store. . . .



... One doesn't forget army habits so soon. I can still hear the voice of the sergeant singing out at exactly six in the morning: "Rise and shine!" And to this day I get out of bed at the same hour and do my setting-up exercises. It helps me start the day feeling fresh and cheerful. . . .

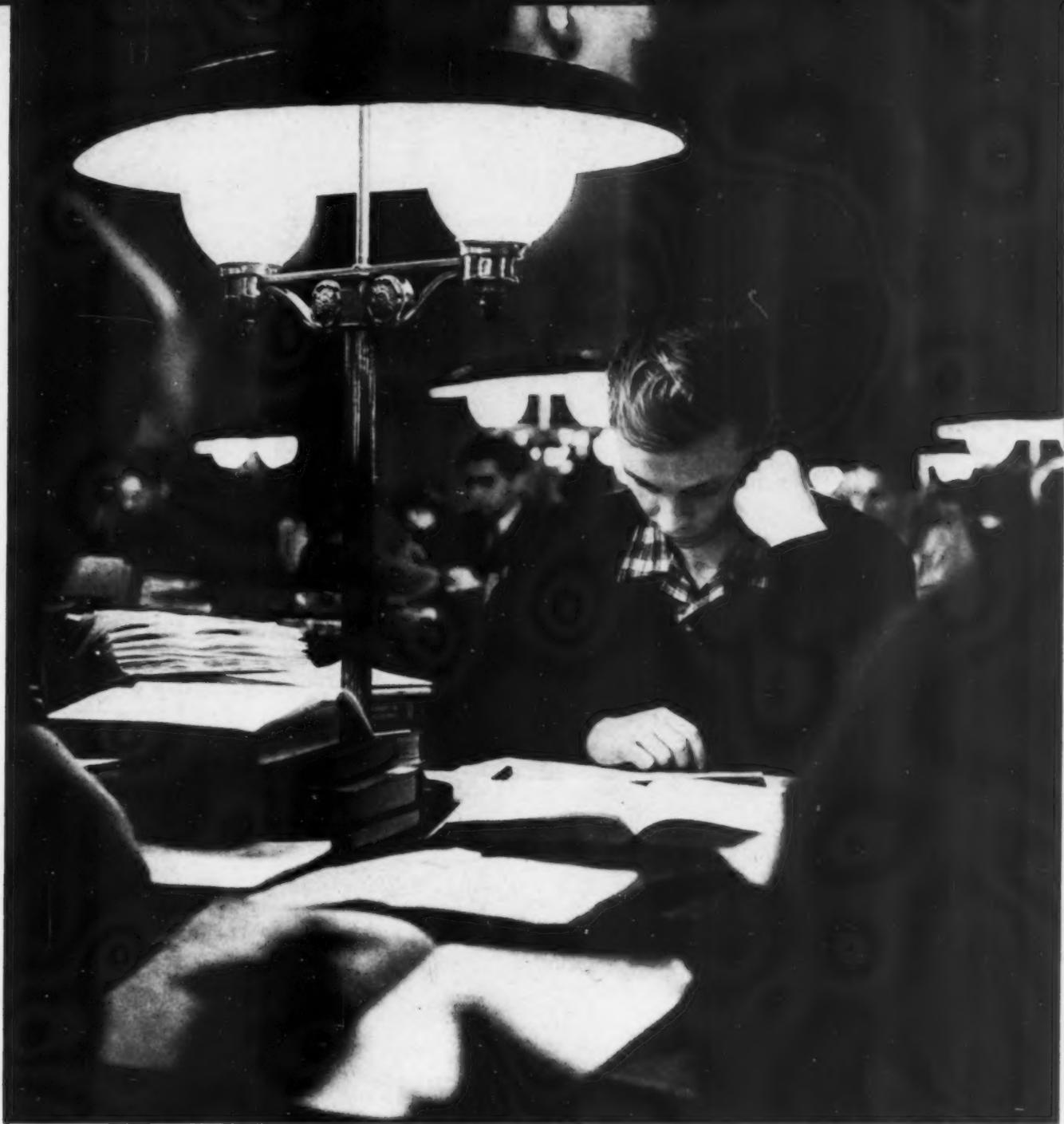


... I was given a friendly welcome when I reported at the plant for the first time. I soon struck up a fast friendship with many of my shopmates. The work was interesting. I started off as a technician with a monthly salary of 1,000 rubles. I met other fellows at the factory who had also come from the army. Most of them wanted to raise their qualifications and were attending evening schools and colleges. The factory administration encourages the workers to continue their education. . . .

BACK TO CIVILIAN LIFE

... Ivan Petrov, whom you see in this picture (he is also shown on the front cover), is an old pal of mine. We went to school together and were recruited into the army on the same day, but we served in different places. Ivan and I were demobilized almost simultaneously. Years pass, roads part, but old friendships remain dear. I sometimes go over to the Krasnaya Roza Textile Mill where Ivan is a maintenance mechanic. . . .





... While in the army I made up my mind to get a technical education and become an engineer. So, as soon as I got back home I started taking college preparatory courses. Last summer I passed my entrance exams and became a freshman at the Moscow Electrical Engineering Institute. Now I attend classes four nights a week. I spend a lot of time in the Lenin Public Library. This picture of me was taken there. I really want to be a good engineer, and I will be, no matter how much time and effort it takes. . . .



... I met Nina Orekhova when she was a student at a technical school. I promised to write to her when I left for the army, and there's no need to say that every time a letter arrived from Nina, my day was made. When I returned home, we spent almost every evening together. I would wait for her at the entrance to the Automobile Engineering Institute—she was a freshman. We would go to the movies or occasionally to the theater. Sometimes we would go out to dinner. Soon we were married. Both of us have jobs and go to evening school. She's a sophomore now. . . .

BACK TO CIVILIAN LIFE

... I'm a father! Nina gave birth to the most beautiful baby last autumn. We named our daughter Irina. Of course we have more responsibilities now, but we love them. To tell you the truth, though, my mother helps a lot. She waited so long to become a grandmother that she just can't tear herself away from her first granddaughter. She really takes good care of our baby. . . .



... I spend practically all day Sunday with my first-born. We both enjoy our walks on Tverskoy Boulevard where we live. Nina gets lunch ready while we're out. After we've eaten the three of us have a gay time. Irina is beginning to make those delightful baby noises that precede talking, and she really notices everything around her. She grabs for things and even tries to turn over by herself. . . .



... It's winter now, but I'm waiting impatiently for summer. You see, I've bought a Java motorcycle, a popular Czechoslovak model. When the last bit of snow has melted, Nina and I will take trips to the country on Sundays. In the meantime, all I can do is fuss around the machine, check the parts, and caress its shining surface. . . .

This is what my life has been like since demobilization. There's nothing special about it. I'm sure it's been about the same for the other men who returned to civilian life. We all received good schooling in the army, went back home, found suitable employment and arranged our personal affairs. Each one of us has his own dreams and plans for the future. They'll all become reality one day, I'm sure.





ACS (AUTOMATIC CONTROL SYSTEM) DRIVES THIS TRAIN. THE ROBOT CAN DO 2,000 MATHEMATICAL OPERATIONS IN A SPLIT SECOND AND HAS AN INFALLIBLE MEMORY.

ROBOT LOCOMOTIVE ENGINEER

By Ivan Frolov

WE board the three-car train at the Kuntsevo station near Moscow. Nikolai Nikolayev, chief of the special design office of ACS—the initial letters of Automatic Control System—takes us through the train. Superficially, it looks much like the usual electric train with this one startling difference—it is not driven by a human engineer. ACS is doing the engineer's job on this test run.

The front end of the first car looks like a laboratory with its control instruments and switches. Yevgeni Alexeyev, an electrical engineer

who is one of the men testing the train, sits facing an electronic oscillograph screen. He watches the shifting green lines, writes down some figures, compares them with a mathematical table.

Nikolai Nikolayev explains: "All the data registered by the control instruments are reproduced on the oscillograph screen. And the instruments here," he points to metal cabinets, "drive the train. This one holds a computing machine which solves the complex differential equation of the train's movements. And in this one is a 'memory block' with coded information on the grade of the track, length of the line and other such data. The automatic driver receives its information about the actual speed of the train and the distance it travels from special transmitting elements in the wheel axles."

We hear the characteristic hum of a working generator. Lev Motavkin, head of the laboratory of data processing machines, announces: "We're ready to move," and the robot train pulls smoothly out of Kuntsevo station and speeds along past fields and houses.

Nikolayev pats one of the cabinets. "It's almost human," he smiles, "or super-human would be a better way of putting it. Super-intelligent and a never-failing memory—that's a combination hard to beat. When a human engineer drives a train, he has to make his decisions by choosing from one of a number of possibilities. Maybe he picks the best, maybe he doesn't. But our robot here decides instantaneously and makes the best possible decision. In a split second it can do two thousand mathematical operations."

As we travel along we can almost imagine we hear the automatic engine driver making calculations, adding and subtracting the thousands of electrical impulses that control the run.

"Our engineer," says Nikolayev, "takes everything into account—the grade, brakes, weight of train and load, timetable—everything."

The train picked up speed to climb a steep grade and then leveled down to an exact 50 miles an hour. Approaching Usovo, the end of the test run, we felt the brakes being applied by our invisible engineer as the train rolled smoothly into the station.

AN OSCILOGRAPH SCREEN SHOWS DATA REGISTERED BY THE CONTROL INSTRUMENTS.



VLADIMIR DIVIN

veteran railroad worker

By Yakov Mikhailov

VLADIMIR DIVIN is a locomotive engineer on the Moscow section of the Northern Railway. He's been a railroad man going on thirty years now and he says if he had to pick his trade all over again, chances are he'd pick the same one—which says a good deal for a trade. It pays well, the hours are good and he has plenty of time for his favorite avocation, gardening.

Divin leaves his home at 7:30 every morning. For the six minutes it takes the electric train to bring him to the engine shed where he's been working for twenty years now, he's a passenger, a somewhat critical one if his watch clocks too many seconds more than the six minutes the run should take.

At the shed he puts on his work clothes and carefully checks the time again. Like every good railroad man, he's a clock-watcher—one of the few trades where that is a virtue.

With his assistant he readies his electric locomotive for the day's run. At 9 o'clock he gets the dispatcher's orders by radio. "Hitch your engine to the Moscow-Khabarovsk passenger train. It leaves at 9:30."

Divin starts his locomotive smoothly and listens a second or two. It sounds all right, and he gets the train rolling. His engine is scheduled for Alexandrov, where a diesel locomotive will take over. Divin will then shift his engine to a train coming into Moscow. By 3:45 he will be back in the engine shed and his workday is over.

For every hour of work Divin gets a basic 9 rubles 20 kopecks. In addition, he gets a monthly bonus if he runs strictly according to schedule and if he manages any saving on electric power. This bonus averages 400 rubles a month—an additional 2 rubles 50 kopecks for every hour of work. Besides that, as an engineer of the first category—a level he reached because of his thirty years of railroad experience and technical study he did—he gets another 2 rubles 60 kopecks for every hour of work he puts in.

His total hourly wage then is 14 rubles 30 kopecks. The last monthly entry in Divin's pay book—and it is rather typical—showed that he received 2,288 rubles for the 160 hours he put in that month.

During the winter his monthly earnings for the same number of hours of work are higher since locomotive engineers get more money for driving in bad weather. To keep the trains running during the Russian winter is no job for an amateur. So that for the winter of last year, for example, Divin's earnings ran better than 3,000 rubles a month.

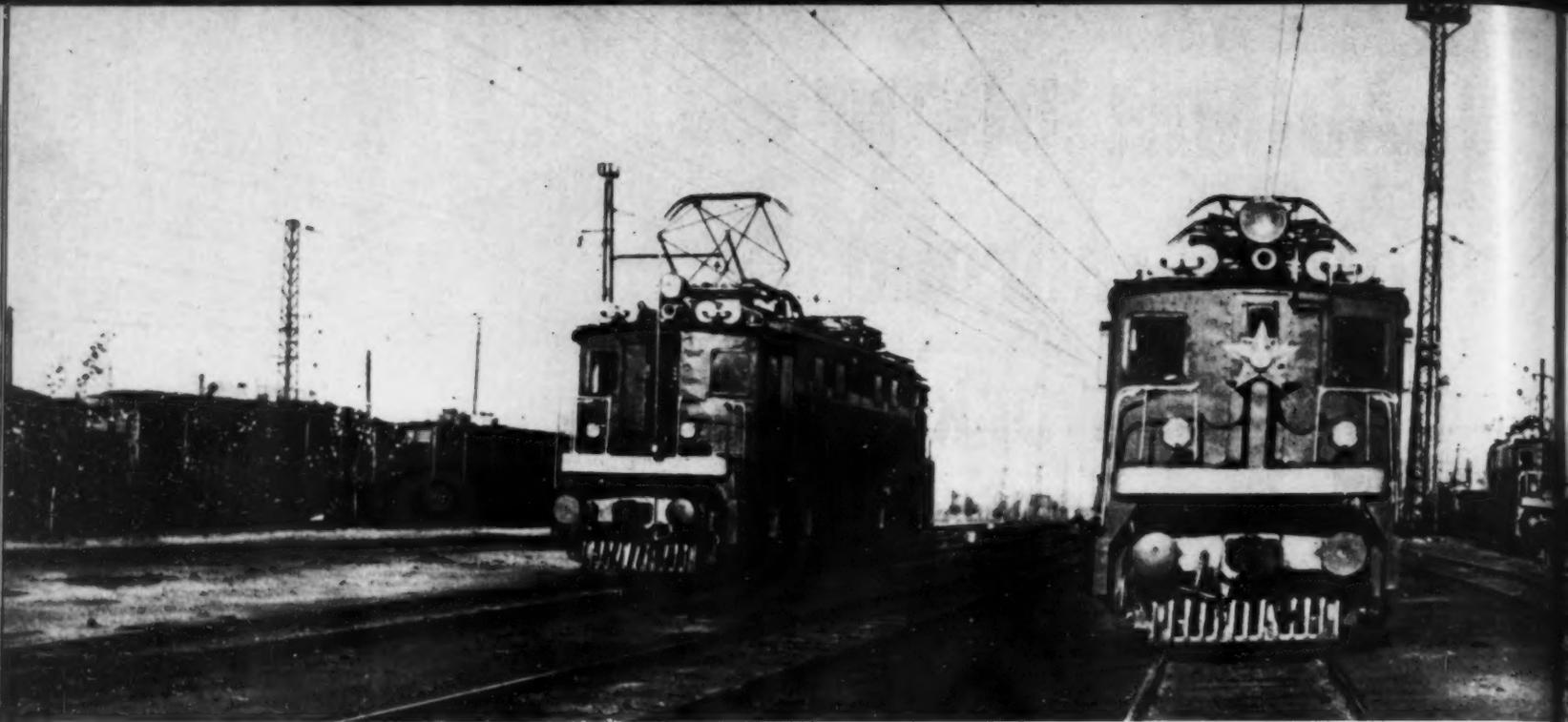
On his way home, a passenger once again, Divin's commuter train passes Moscow's suburban cottage communities—Los, Perlovskaya and Taininskaya. He knows a lot of the people who get on and off the train, they are old friends and neighbors. He was born in this part of the region 53 years ago. He went to grade school here and then, after the Revolution, to the Northern Railway School.

His father was a railwayman who worked as a fitter all his life. Vladimir had more chance than his father had to move ahead, more education and more opportunity. When he was 26 years old, he became a locomotive engineer and seven years later drove his first electric locomotive.

"The Moscow section of our Northern Railway," says Divin, "wasn't electrified until 1927. Now all ten railways that tie in Moscow to the rest of the country have been electrified over large stretches."



EVERY MORNING ENGINEER VLADIMIR DIVIN BOARDS HIS LOCOMOTIVE IN MOSCOW.



VETERAN RAILROAD WORKER

Whenever Divin talks about the railroad, he uses the possessive—*our* Northern Railway. He's pretty partisan to his particular road, like many railroad men, and to railroading in general. Asked whether increased automobile travel and haulage has cut into railway traffic, as it has in some countries, he answers with an emphatic negative. "It will be a long time before that happens here—if ever. Our country is growing so fast, it can use much more of every kind of transportation."

Divin thought that his eldest son, Yevgeni, would go into railroading. He did some gentle pushing in that direction. But Yevgeni had other ideas, he wanted to become a power engineer. Three years ago he graduated from the Moscow Power Institute and now works at one of the suburban plants. His wife Lyuba—he first met her at the college—also works there. Two years ago the young couple presented Vladimir Divin with his first grandson.

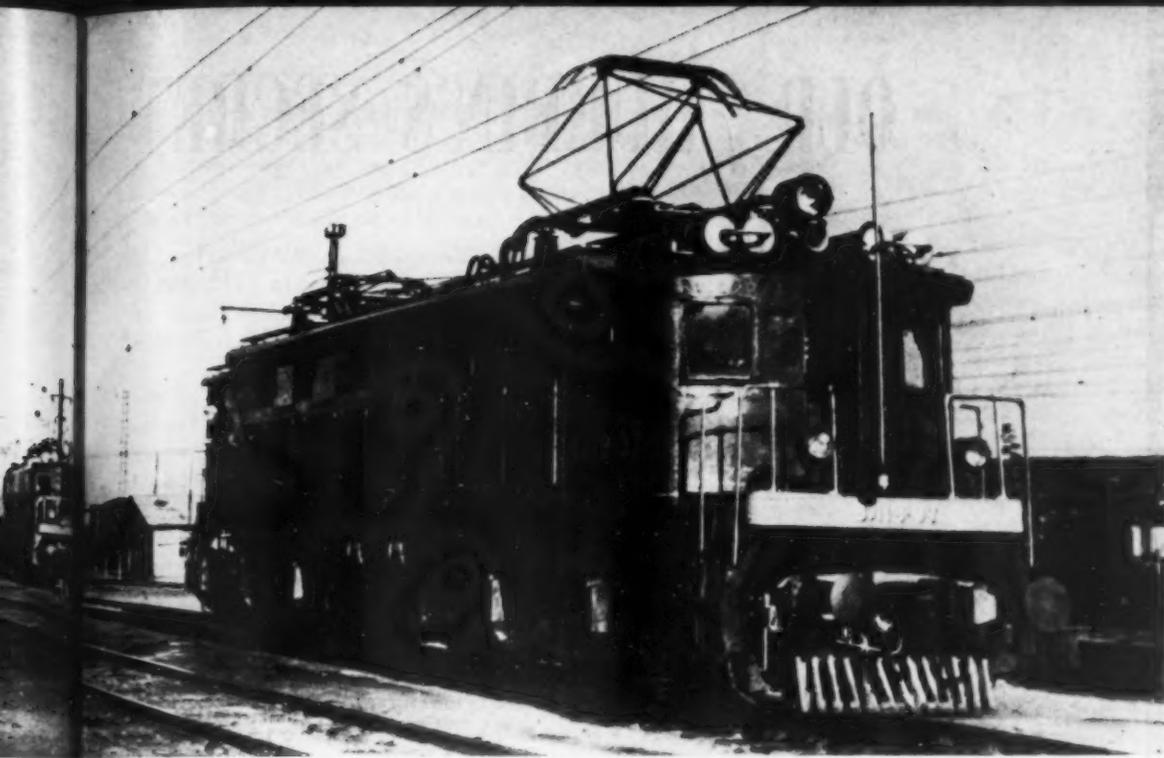
But Vladimir is pleased that his younger son, 13-year-old Gennadi, spends most of his spare time at the engine shed. Gennadi knows his father's locomotive from top to bottom. "I think the boy could take the engine apart and put it together again," says his father. "He's got the makings of a railroad man."

LITTLE LYONYA DIVIN LOVES TO VISIT HIS GRANDMA AND GRANDPA.



When Vladimir Divin pulls the Peking Express into Moscow's Northern Station, it's quite safe to set your watch.



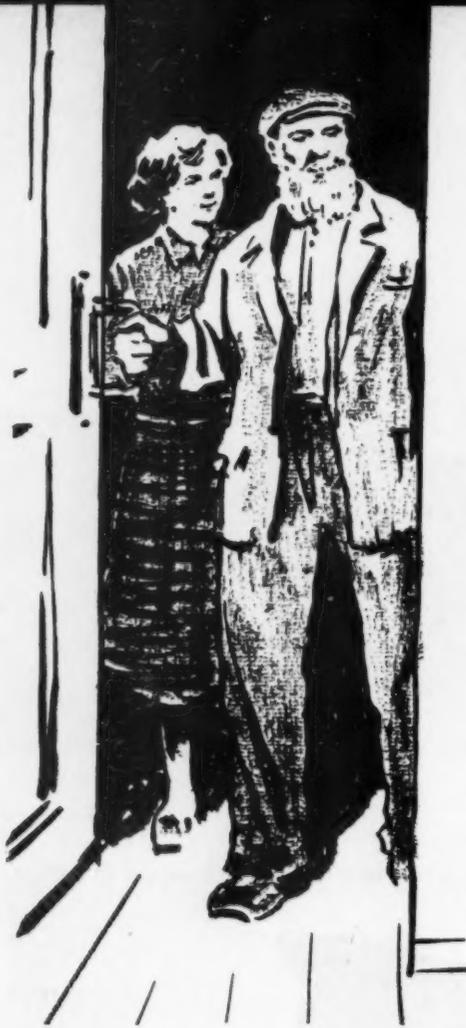


All ten railways that connect Moscow with the rest of the country have been electrified over large stretches.

DIVIN'S 13-YEAR-OLD SON GENNADI SPENDS ALL HIS SPARE TIME AT THE ENGINE SHED AND KNOWS HIS FATHER'S LOCOMOTIVE FROM TOP TO BOTTOM.



OLD ZHURBIN'S SECRET



Vsevolod Kochetov, popular contemporary Soviet writer, is the editor of the *Literary Gazette*. He was born in 1912 and is an agronomist by training. His career in journalism began in 1938. During the Second World War he served as front-line correspondent.

Kochetov's first major work, the novel *On the Plains of the Neva* (1946), tells the story of the heroism of wartime Leningrad volunteers. His subsequent books won Kochetov an eager reading public, for he is a man with very definite and original opinions, and his books ably express his views.

Two of his most popular novels, *The Zhurbins* (1952) and *The Brothers Yershov* (1958), trace the histories of two workers' families. In describing the lives of his characters, Kochetov brings them up to our own times, skillfully weaving into the story the changes brought about by the new social relations which are a product of Soviet society.

The excerpt published here is taken from *The Zhurbins*. The novel's setting is a large shipbuilding plant. Ilya Matveyevich Zhurbin, head of the family and a veteran worker at the plant, is one of the main characters. His elder son Anton, a ship designer, has introduced new production methods to expedite ship assembly which necessitates the retraining of the plant's workers.

Faced with the choice of learning a new trade or quitting his job, old Zhurbin, who has a wealth of experience but no formal schooling, decides to begin a course of study. He wants to keep it a secret from his family and goes to the young engineer Zina Ivanova for help.

By Vsevolod Kochetov

HE FOUND her in the technical information office. A meeting had just ended, and the room was full of smoke. Zina was opening the windows. Ilya Matveyevich began examining an unfamiliar piece of welding apparatus that was lying on the table.

"It's the very latest," said Zina. "We received it a day or two ago. I got the foremen together and told them about it. They seemed pleased. They say it's a good one. Please take a seat, Ilya Matveyevich."

"I've no time for sitting down. I just dropped in for a minute." He hadn't thought it would be so difficult to get the conversation going. "The matter I wanted to talk to you about . . . what's the best way of putting it? . . . Well, who am I from the point of view of science?"

Zina's eyes widened in surprise under their golden lashes.

"Yes, that's a strange question," continued Ilya Matveyevich. "Put it a different way. I never managed to get in any study at school. I did my studying on the stocks. That knowledge is sound stuff, but it's one-sided—it doesn't give you the whole picture. I'm working on my own, of course, I'm having a little chew at it, but I can't chew it all, there's too much of it . . ."

And again he couldn't get the main thing said, his reason for coming.

"Do you want me to help you?" asked Zina, incredulously; her eyes had opened even wider.

"Why not? Can't you manage it?"

"It's not that . . . I don't know . . ." Zina was confused. "Can I do it? A man like you! . . ."

"We can have a try. Do you feel up to it?"

"Oh, of course. I'd be so glad! But I'm afraid you won't be satisfied."

"So it's a deal? When shall I come?"

"Come where? I'll come to you."

"No, that won't do. I'm the pupil, I must come to you. That's the only way, Zina. . . ." Ilya Matveyevich faltered, then added in some embarrassment: "There's one condition, by the way . . . no one must know about this, not a soul. Neither my family nor strangers. Just as

if I wasn't taking any lessons. I'm ashamed to be studying at my age."

"Ashamed to be studying? You're wrong, Ilya Matveyevich!"

"Wrong or right, I'm ashamed—and that's all there is to it."

They agreed to work two evenings a week, and fixed the days. Ilya Matveyevich left. Zina was worried. Whom had she undertaken to teach and was she a suitable teacher for Ilya Matveyevich? Should she have refused? But how could she have? To refuse such a request would have been out of the question. No, she would try; she would try to do everything she could for Ilya Matveyevich. Amazing things were happening here on the Lada! You were an engineer, you had a diploma, but you weren't entrusted with serious independent work, they said you needed experience. And then a man with experience, life-long experience, came to you to learn things they taught at school. Perhaps it was like that not only on the Lada, but everywhere in life? Zina still did not know much about life.

The lessons went quite differently from what Zina had imagined. It was difficult work. They started with physics. Ilya Matveyevich knew practically nothing about gases and very little about electricity. They had to take everything from the beginning. On the other hand his practical knowledge of mechanics would have been the envy of any graduating student at the institute.

Zina worked with Ilya Matveyevich, showing extraordinary patience. She even read several pamphlets on teaching. But that didn't help. What was good for children wasn't much good for Ilya Matveyevich. There was no need to force him or egg him on; all he needed was to have things explained. A simple matter? Not so simple. You would explain one thing; he would insist that he couldn't understand. Then you began to explain something else, not a bit less complicated, and he'd say: "Why waste time going over all that stuff? It's clear without any explanation." And he would get offended, too.

It was hard for Zina, very hard, and yet she never once regretted giving Ilya Matveyevich lessons. The results were too obvious for that.

Stubborn in everything, Ilya Matveyevich was stubborn in study, too. Steadily and unhurriedly, but with amazing thoroughness, he accumulated knowledge; he seemed to be constructing a house, laying the stones firmly together, without any cracks, and only when he had finished one row would he tackle another. "That's how he builds ships, too," thought Zina, as she watched him.

Ilya Matveyevich took lessons with Zina all through May. He came to her on Mondays and Thursdays. At home he would say he was attending a foremen's course, going to the baths or fishing. When he told them he was going to the baths, he would come to Zina's with a brief case holding a towel; when it was "fishing," with rods and a can of worms.

Agafya Karpovna, his wife, was surprised at how long he took at the baths. "Dozed off in the steam—lovely!" he would announce cheerfully when he got home. "You'll doze off one of these days and not get up, if you don't look out," fussed Agafya Karpovna. "You're no chicken, you know, to go steaming your heart out." The family was surprised, too, that the fish suddenly seemed to have stopped biting. Wherever Ilya Matveyevich went, or said he went—to the Lada or the Veryazhka—he would either come back empty-handed or carrying a dozen little fish which he bought from the boys on the bridge.

One Thursday Ilya Matveyevich missed a lesson. There was a Party meeting and it ended late, past ten. So he went to Zina on Friday—on the off-chance. He didn't want to waste precious time. You couldn't go out on Saturday, you had to sit at home with the guests; on Sunday you would have to hang around as usual. Wait till Monday, then? Too long. He arrived with his fishing rods.

Zina was at home, but for some reason blushed furiously when she opened the door. "Hope I haven't bumped into her boyfriend," thought Ilya Matveyevich when he saw how confused she was. "This is a rum do!" He marked time for a bit in the foyer and glanced into the living-room. Well, I'm blown! At the table sat Alexei, his son. So this is where you come—you do get around, don't you, my boy!

They glanced suspiciously at each other: Alexei swept something off the table on to his knees:

"Dad!"

"Yes, it's me." Ilya Matveyevich came into the room.

"What are you doing here?"

"Just called."

"Just called? So we both just called. I've got to talk to Zina about the technical information service. What's that you're hiding under the table, eh?"

Zina did not know what to do: she was thoroughly upset. Suppose Ilya Matveyevich had a row with Alexei? How awful!

"Under the table?" answered Alexei. "A book. Here it is!" He threw a physics book on the table.

Ilya Matveyevich saw that it was his own; he glanced at Zina indignantly. Had she given the secret away? And to Alexei of all people. Now it would get around!

"What did you take it for?" he asked.

"Just to have a look. Why, wasn't I supposed to?"

"Why shouldn't you? It's not mine. Look at it if you like."

"Dad," said Alexei with a smile. "This book is yours." He opened the textbook. On the fly-leaf was written: I. Zhurbin.

Ilya Matveyevich muttered something under his breath.

"Dad," said Alexei again. "Don't make a mystery of things."

"What mystery? I'll be giving you 'mystery' on the back of your head in a moment!"

"Go ahead, I don't mind. Only don't make a mystery of things. Why. I see you every Monday and Thursday from my window, coming to Zina's. What did you bring today, your brief case or your fishing rod?"

Taken aback, Ilya Matveyevich tugged hard at his eyebrow and frowned.

"My fishing rod," he answered, and there was a merry gleam in his eye. "And what do you bring?"

"Nothing. I've got nothing to hide. I just slip across from one entrance to the next and here I am. So you came for a lesson, did you. Dad? Maybe you'd like me to go?"

Old Zhurbin could not help giving his son credit for the way he had acted. He had known, the young rascal, but he hadn't blabbed about it.

"Stay where you are," he said, "we'll go home together. Well, shall we begin, Zina?"

"What are you on now, Dad?"

"Study with me and you'll find out. It'll do you good."

Zina was relieved; the crisis had passed. The Zhurbins had not quarreled.

While Ilya Matveyevich had his lesson, Alexei sat and listened. When it was over he said:

"I'm beating you, Dad!"

"How do you mean?"

"Got ahead of you, gone further through the textbook."

"Where've you got to, son?"

Ilya Matveyevich began examining his son, his son paid him back in the same coin. "Come on, solve this!" one of them would say, pointing to a problem. The other would solve it and then insist: "Now you just try this one!" They were more exacting with each other than the strictest teacher.

"Where are you studying?" asked Ilya Matveyevich.

"At evening school, in the tenth grade. Like Anton did. Why don't you go there, too? I expect Zina is finding it difficult. She used to coach me; now she's coaching you. We're exploiting her!"

Zina protested that they weren't.

It was time to go. When he saw the fishing rods in the hall, Alexei laughed:

"You're a queer fisherman, Dad!"

"Pick 'em up, you can carry them home for me."

They said good-bye to Zina and left. On the road Ilya Matveyevich asked:

"How about you? Are you just studying out of general interest, or is it with a purpose?"

"With a purpose. I want to get an engineering degree."

"That's right; that's the idea. Where're you going to put in for?"

"Where Anton studied, of course at the institute. I've made inquiries: they have evening courses."

"Go ahead, boy, keep it up. If it gets too hard, you can give up your job."

"No, Dad, I won't give up working. I couldn't get along without the job."

"How do you mean, you couldn't get along? Your father can feed you. I hope."

"I'm not talking about food. You know what they say: work is a natural need of man."

"I see what you mean. And here's one other little question for you. You're not romancing there with Zina, are you? Don't get angry, it's just a fatherly inquiry."

"You're imagining things!"

"No, I'm not. She's a nice right-thinking kind of girl, any man would be lucky to have such a wife."

Ilya Matveyevich kept silent all the way to Anchor Street. At the gate he said:

"Keep quiet about you and me being school kids. Understand?"

"I understand."

"Come in and have some supper. What shall we say? No fish again."



EXCHANGE PROGRAM IN PROGRESS



THE Soviet Union has a total of 90 exchange agreements with foreign countries. They were negotiated by the contracting governments in recognition of the fact that contacts between different nations, irrespective of their social systems, pay rich dividends in understanding and friendship and that they make substantial contributions to world peace.

February sees the Soviet-American exchange agreement in the fourteenth month of its two-year term. During this time there was hardly a week when some delegation or group has not been visiting in one country or the other. There were, for example, exchanges of delegations of power engineers, of steel and mining specialists and of experts from the plastics and chemical industries. These were the groups specifically mentioned in the agreement.

Among the "bonus" exchanges over and above the program were reciprocal visits of automation specialists, radio and electronics engineers, construction and building experts. There were also delegations attending various technical and scientific conferences held in both countries, groups visiting exhibitions or fairs.



During the meeting with Alexei Pavlenko, Minister of Power Stations, the guests received all information they wanted.

The American engineers were the first foreign visitors to inspect the new Lenin Hydroelectric Station on the Volga River.



POWER EN

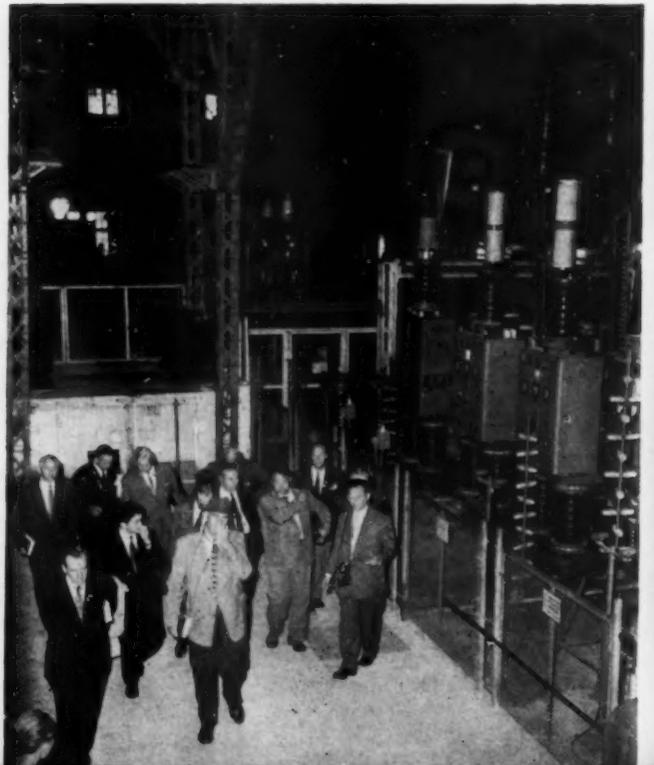
A DELEGATION of power engineers from the United States was the first foreign group to go through the newly completed Lenin Hydropower Plant on the Volga River near Kuibyshev. The delegation was headed by Walker L. Cisler, president of Detroit Edison, and included representatives of General Electric, Westinghouse, Allis-Chalmers and other big companies.

The American guests received all the information they wanted on the planning of the Soviet Union's electrification, on various problems of power engineering, methods of the construction and exploitation of power plants and on Soviet types of power equipment. Talks at the USSR Ministry of Electric Power Stations and research institutes in Moscow were followed by a 2,500-mile tour that covered ten cities, the largest power plants and construction projects.

Visiting the Lenin Plant, the world's largest hydroelectric project, the American engineers were generous in their praise of the designers and builders of this giant constructed in a record-breaking seven years. During their 16-day stay in the Soviet Union the guests also saw an even larger hydropower plant under construction on the Volga's lower reaches near Stalingrad.

In the Ukraine they went through the Dnieper Hydropower Plant and

On a tour of the Kashira Station, a large power plant using local peat for fuel.





Experiment with super-heated steam in this installation caught all eyes.

ENGINEERS

a number of major thermal plants. They visited related industrial plants in Leningrad, Zaporozhye and Lugansk, and inspected the experimental atomic installations and the Atomic Power Station near Kaluga.

Armed with a background of facts and figures acquired in visits to scientific centers and government agencies, the visitors were able to observe for themselves Soviet power engineering in practice today and the great sweep of its future that could be sketched from the construction work proceeding across the land.

There was much that was instructive, the Americans commented, much they had learned that could be profitably introduced in their own work at home. The general Soviet practice of prefabricating large sections at manufacturing plants, they noted, was a considerable saving in cost and construction time. They found most impressive the large scale on which power projects were being planned and built.

At the close of the tour Mr. Cisler expressed the thanks of the entire delegation for the very friendly reception they had met. American and Soviet power engineers, he thought, had aims that were so common and problems that were so related that he was glad to see them coming together in such exchanges of ideas and information as this mutually instructive visit.

Indicators on the control board are closely watched when the load exceeds the 115,000-kilowatt mark.



This Soviet-made turbogenerator unit was explained in full detail.

GUEST ARCHITECT



EDWARD DURELL STONE, eminent American architect who designed the U.S. Pavilion at the Brussels World's Fair, is shown above (at the left) with his wife during their tour of the Soviet Union. Among the places they visited was the USSR Academy of Construction and Architecture where this picture was taken.

Mr. Stone made his trip outside the formal agreement on exchanges, at the invitation of the Soviet Architects' Union. He said he was very impressed by the scope of construction planned for the next seven years and he felt that the program offered Soviet architects tremendous creative opportunities.



Clad in their national dress, Lithuanian farm girls visiting an exhibition in Moscow were pleased to exchange views with the American youth group.



EXCHANGE PROGRAM

IN PROGRESS

STUDENT CONTACTS

APART from occasional international gatherings such as the World Youth Festival held in the summer of 1957 in Moscow, there had been practically no contact between Soviet and American youth and student groups up to the signing of the exchange agreement.

To implement the agreement's provisions in this field, the American Council on Student Travel and the Committee of USSR Youth Organizations worked out the details and as a result there were reciprocal visits of large student groups to both countries and an exchange of delegations of editors of student and youth publications.

Shown on these pages are pictures of an American delegation of 41 students taken during their 40-day tour of the Soviet Union. Divided into groups they traveled to many parts of the country and reported an exciting and memorable round of visits to colleges and universities, factories and farms, clubs and theaters. There were endless talk-fests with the Soviet young people, exchanges of ideas, souvenirs, mementos and friendships.

A wonderful first visit, let's make it one of many—this was the parting comment of the young Americans. Said Richard Roll: "Wherever we went our hosts did their best to meet our requests. We were all deeply touched by the friendliness with which we were met everywhere and by the interest in our way of living." Ann Kern was most impressed by the serious approach of Soviet young people to their studies and the opportunities for education open to every citizen.

One of the Americans aptly described this first visit as a good rehearsal for the future. To be friends, people from different countries must meet more often—this is the opinion of American students who visited the Soviet Union.



UNIVERSITIES trade STUDENTS

DAVID MACKENZIE, shown here, is one of 20 American students enrolled in Soviet universities. He is a graduate of Columbia University and is now working on his doctorate in history at the University of Moscow.

The American students came to the Soviet Union under a provision of the exchange agreement. A group of 20 Soviet students is enrolled in American universities. Arrangements for this exchange were made by the Inter-University Committee on Travel Grants on the American side, and the Ministry of Higher Education for the Soviet Union. The Americans chose the Universities of Moscow and Leningrad and the Soviet students, the Universities of Chicago, Washington and California as well as Harvard and Columbia.

All of the American and Soviet young people participating in the project are studying at the expense of the host country. They are paid monthly stipends and are provided room and board in student dormitories. The students of both countries for the most part are doing graduate work and are specializing in their chosen subjects that cover various fields of the humanities, science and technology.



Everywhere they went, the Americans swapped souvenirs or tokens with their Soviet friends.



The American students visited many factories besides touring the schools.

Young people of both countries had a keen mutual interest in getting autographs from each other.

Meetings at colleges and universities were well attended even though the guests arrived during the summer vacation.



Many of the visiting Americans used their cameras to record displays such as a full size model of Sputnik II.



An eagerness to talk and make friends was noted by the visitors at each stop during their tour of the country.



"Seeing the sights" during a break between business visits, meetings and conferences.

AGRICULTURE, which plays such an important role in both the Soviet Union and the United States, has had a big part in the Soviet-American exchange program. During 1958 there were six delegations from each country and their interests covered nearly every phase of farm activity.

For the Americans, the groups covered agricultural economics, farm crops, soil and water uses, veterinary and mechanization. The Soviet delegations were those on mechanization, livestock, veterinary, soil and water uses, cotton, rural electrification and construction.

All delegations toured farms of many types, agricultural exhibitions, experimental stations, research centers and agricultural colleges as well as food processing and packing plants.

The photographs on this page show some of the American farmers during their visits to the Soviet Union.

AGRICULTURAL SPECIALISTS



EXCHANGE PROGRAM

IN PROGRESS



Viewing displays at the Ukraine's Pavilion of the USSR Agricultural Exhibition in Moscow.



Various types of agricultural machinery and equipment were closely inspected both at exhibitions and on farms.



The language barrier was no obstacle for the exchange of opinions.

Progress Report to Oklahoma Farmers

By LEONID MANKO

Chairman, Michurin Collective Farm

IT WAS some three years ago that our collective farm here in Kazakhstan was visited by a group of Oklahoma farmers, but we still have very warm memories of all the talk we exchanged. We haven't forgotten the very helpful suggestions they gave us on feeding rations and the care of livestock.

All of us here think that William Lambert, who headed the delegation, and the other Oklahomans would be interested in a progress report. What's been happening on our farm in the three years since they saw it.

We hadn't much to boast of at the time the American guests were here, even though Mr. Lambert congratulated us on the rich milk our cows gave. But the picture is much different now. We keep only high-yield cows of the Alatauuskaya breed evolved by Soviet stockbreeding stations. With this purebred livestock our milk yield has tripled over the 1955 level. Our cows give milk with a 4 per cent butterfat content.

Our barns are now fully mechanized, all the way from automatic preparation and delivery of feed to milking. Our main feed is corn and we've expanded acreage under fodder crops so that we have plenty to go around. That's for our dairy.

Mr. Lambert would see big changes in our grain crop and in our fruit production, too. We've sown more acreage in wheat and have extended our orchards and vineyards.

Last spring a national law was passed to reorganize the country's machine and tractor stations into maintenance depots. We bought from our local station 1,500,000 rubles' worth of various farm machinery.

We had the money to invest since our stock farm now gives us double the income it did at the time the Oklahoma farmers were here. The total income of our farm for 1958 was 20 million rubles.

With farm income larger, the amount of income that is divided among our members is larger too, of course. The Americans would, I think, be surprised at the way our village has changed in the past three years because of the number of new houses that have been built. We have plans now for a new community center, a restaurant, a hotel and several retail shops.

We told the Oklahoma farmers when they visited three years ago that we hoped to overtake American per-capita production of meat and milk in the next couple of years. Well, we'd like to tell them now that these next couple of years we talked about are just about over. By the end of this year, we expect our hopes will have become reality.

1956 — OKLAHOMA FARMERS GREETED AT THE MICHURIN COLLECTIVE FARM WITH TRADITIONAL BREAD AND SALT.



A TOUR BY CAR

DURING last summer some Americans who visited the Soviet Union decided to tour the country in their own cars. Among these tourists were the Keratt brothers, Chris, a professor at the University of Florida, and James, a physician.

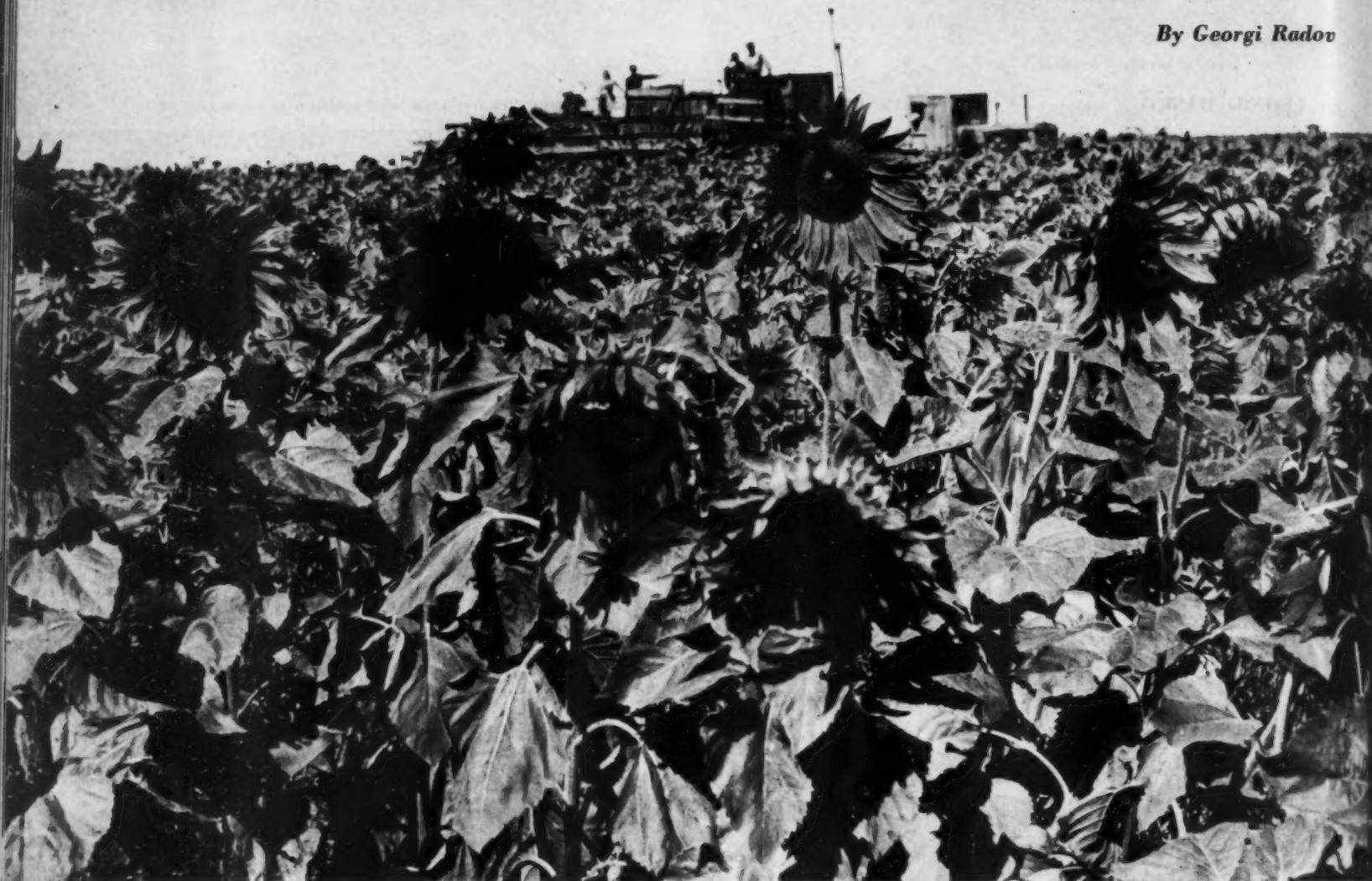
En route to the Crimea, they stopped off to see the Kursk Magnetic Anomaly, site of the world's largest iron ore deposits. Engineers Alexander Orlov and Oleg Zore showed them around the works and described the special drilling operations that are conducted there.

The Florida brothers also stopped over at one of the collective farms just off the Moscow-Simferopol highway. They got an excellent view of the fields from atop a grain combine.



He Changed The Nature Of The Sunflower

By Georgi Radov



NEW VARIETIES COMBINE HIGH OIL CONTENT WITH A HIGH YIELD. THE FARMERS NOW GET 4-6 TIMES MORE SUNFLOWER SEED OIL PER ACRE THAN FIFTY YEARS AGO.

VASIL PUSTOVOIT's forty-five years of experimental selection with the sunflower plant is a tribute to the stubborn and unyielding patience of a man who would not put up with nature's inadequacies.

The sunflower, with its big dark disk and radiant yellow petals, is more than a handsome plant. In Russia, America and elsewhere it has long been grown as a money crop. The seeds of the disk give a yellow oil with a rich flavor considered by many to be the equal of olive oil for table use. Compressed, they make an oilcake widely used for stock and poultry feeding.

The sunflower is native to America. It was brought to Russia early in the eighteenth century. Grown at first as an ornamental flower, the plant soon after began to be cultivated for its seeds. It was some unknown peasant, without benefit of theoretical background but with the keen eye of practical experience, who must have seen that the flower could be converted from a branching plant into one with a single large seed basket.

This unknown pragmatic selectionist and those who experimented after him based their

selections on the color of the seed bags, on size, yield and ripening time. They improved the plant and found ways of extracting oil from the seed.

Once in successful crop cultivation, the sunflower crossed the ocean again to its native habitat in America. Its Russian history is still reflected in the names of such present-day American varieties as the Russian Mammoth or the Russian Giant.

Nature's Limitation

But there was the one important limitation that nature had set. It seemed to have permanently fixed the quantity of oil that could be extracted from each plant species. Thus, for the castor oil plant the limit seemed to have been fixed at 50 pounds per hundred-weight of seed, for long staple flax at 40 and for the sunflower at somewhere between 25 and 28—no more. And all the efforts of growers, both Russian and foreign, to extract more oil had been altogether fruitless.

When Vasili Pustovoit began to work on the problem forty-five years ago, a long list

of failures had already been recorded. Other selectionists therefore concentrated on boosting the crop yields per acre emphasizing early ripening types, larger size of plants, improvements in growing methods and the use of fertilizers. Pustovoit, however, devoted all his attention to the kernel. His idea was to get extra oil from the same crop and with the same investments.

Pustovoit chose 1,500 seed samples and with his wife as solitary assistant tried an endless number of crossings. He worked under handicaps and without support for years, the czarist authorities were not particularly receptive to new approaches. Many of his crossings were superior. They gave high yields, were resistant to pests and disease but he was notably unsuccessful in increasing the oil content of the sunflower seeds.

A less determined man than Pustovoit would have dropped the search, moved on to more rewarding fields of experiment. But he was plagued by the notion that if he tried enough seed samplings there might be one that would turn the trick. It was not until the Soviet period that he was able to experiment on the



VASILII PUSTOVOIT IS OVER SEVENTY, AND AFTER A HALF CENTURY OF EXPERIMENTING IS STILL ACTIVE.

wide scale necessary. It was then that he was provided with funds, laboratory and assistants at the USSR Research Institute for Oil-Bearing Plants.

Seeds were sent to his laboratory from all over the country and he began the long process of sorting, growing, crossing. In a package which came from Andreyevka Village, near the Sea of Azov, Pustovoi found what he had been searching for. The seeds from this package grew coarse plants with a low susceptibility to disease but they gave two per cent more oil than any other sunflower he had handled in fifteen previous years.

Altering Nature

Now began the slow work of altering this seed so that it would be serviceable. It had to be given new character, changed into a hardy, disease-resistant seed that would yield bumper crops, quite aside from increasing oil content much beyond the additional two per cent.

Pustovoi developed, after much labor, a seed with a high oil content, but the first plants were almost completely strangled by broom-rape, an old enemy of the sunflower. He thought he had given his plants an immunity to this pest. And he had—to the Saratov variety of broom-rape but not to another variety aptly called "the ill-natured Don type," which was little known at the time.

To immunize his plants, Pustovoi took a step which everyone thought extreme. With his next sowing, he dropped broom-rape seeds into the rows. He knew that most of his plants would die but he knew, too, that a few would survive and these would breed hardier plants in the next generation. And this is what happened. The surviving plants produced a hardy enduring plant with high oil content.

Sunflower varieties developed by Pustovoi are now grown in the Soviet Union on more than four million acres of collective and state farms. The oil content of their seeds runs between 47 and 49 per cent. New varieties which Pustovoi has been growing experimentally and which are now ready for general planting give 52.2 per cent.

Many of the new varieties combine a high oil content with a high yield. The farmers now get as much as 1,300-1,400 kilograms of oil per hectare. Fifty years ago the average obtained in the Kuban area where Pustovoi lives and works was only 250 kilograms per hectare.

His experimental plots at the USSR Research Institute for Oil-Bearing Plants have been bringing visiting farmers from distant parts of the country and from abroad. A group of American growers were among last year's visitors to the Institute to congratulate Vasilii Pustovoi on his achievement. As Dr. Herbert Cramer, a member of the delegation, put it, the eminent selectionist had "changed the nature of the sunflower."

In appreciation of his work Pustovoi on his 70th birthday was awarded the Order of Lenin and was elected a member of the USSR Academy of Agricultural Sciences.



These sunflowers live up to such names as Russian Mammoth or Russian Giant.

THE INSTITUTE WHERE THE SELECTIONIST WORKS OFTEN RECEIVES SOVIET AND FOREIGN VISITORS





MEMBERS OF AN AMERICAN AGRICULTURAL DELEGATION AT AN EXPERIMENTAL PLOT ON THE KHARKOV SELECTION CENTER.

American Corn on Soviet Soil

By ILYA YEMELYANOV

Deputy Chief, Administration for Scientific and Technical Cooperation, USSR Ministry of Agriculture

IN STUDYING the history of agricultural development in the Soviet Union and the United States, one finds that their achievements have been successfully and fruitfully utilized by each other.

Quite a number of varieties of Russian wheat, Byelorussian oats and Ukrainian alfalfa are grown in the United States. American varieties of corn, brought to Russia at the beginning of the century, are well known in the Soviet Union. They became particularly popular within the past thirty years.

Tests of American corn varieties during 1924-28 and through the subsequent period demonstrated that many of them were particularly suitable for the Ukraine and the North Caucasus. The favorite varieties were Minnesota 23, Ivory King, Brown County, Leeming, Sterling and Minnesota 13 Extra. In the Central Black Soil Belt and the arid zone along the Volga, North Dakota, Falconer, Burly County and Ivory King were among the most extensively cultivated varieties.

Using American experience in corn selection developed at Illinois and Ohio experimental stations (mass selection in the fields according to type and the method of selection by progeny), Russian selectionists cut the maturing time of Brown County by seven days. Actually two varieties were obtained from Sterling: one with the ear located low—on the first and second nodes, and the other higher—on the sixth or eighth nodes.

In 1956, Mr. Matnys, vice president of the Minneapolis seed house Northrop King & Co., was surprised to find that one of the Sterling varieties his firm sold to Russia forty years ago is still extensively grown.

Soviet selectionists working with American corn obtained good results in early maturity

combined with resistance to draught and frost, while getting high yields. The Sterling variety has proved to be among the best American types for silage in the tremendous expansion of corn as a fodder crop during recent years. Looming, another American type, has also shown up well there.

Beginning in the thirties, a number of Soviet scientific institutes and especially the USSR Institute of Plant Physiology, have worked on inbred and doublecross corn hybrids. Employing both their own and American experience, they produced dozens of hybrids that are now being introduced on Soviet farms.

In 1956 about five million acres were sown to hybrid corn and in 1958 nearly 90 per cent of the acreage sown to corn for grain. Some of these hybrids were from American inbred lines.

The Soviet Union bought hybrid seed during 1956 from such firms as the Pioneer Hi-Bred Corn Co., Garst and Thomas, and Northrop King & Co. These seed were sown for grain and silage over 250,000 acres.

Comparisons of American and Soviet hybrids have been made in all corn-growing zones both under field conditions and on experimental plots for a two-year period. Several Pioneer hybrids of the Pioneer Hi-Bred Co. and of Garst and Thomas Co. proved to have greater yields than Soviet varieties, but they were somewhat later in maturing.

During the past year additional tests of American varieties were conducted to recheck on which would prove most suitable.

Equipment for drying and calibrating hybrid corn seed was purchased by Soviet organizations from Campbell & Fine. When it was installed, it proved to be very effective.

In 1956 we presented American scientists

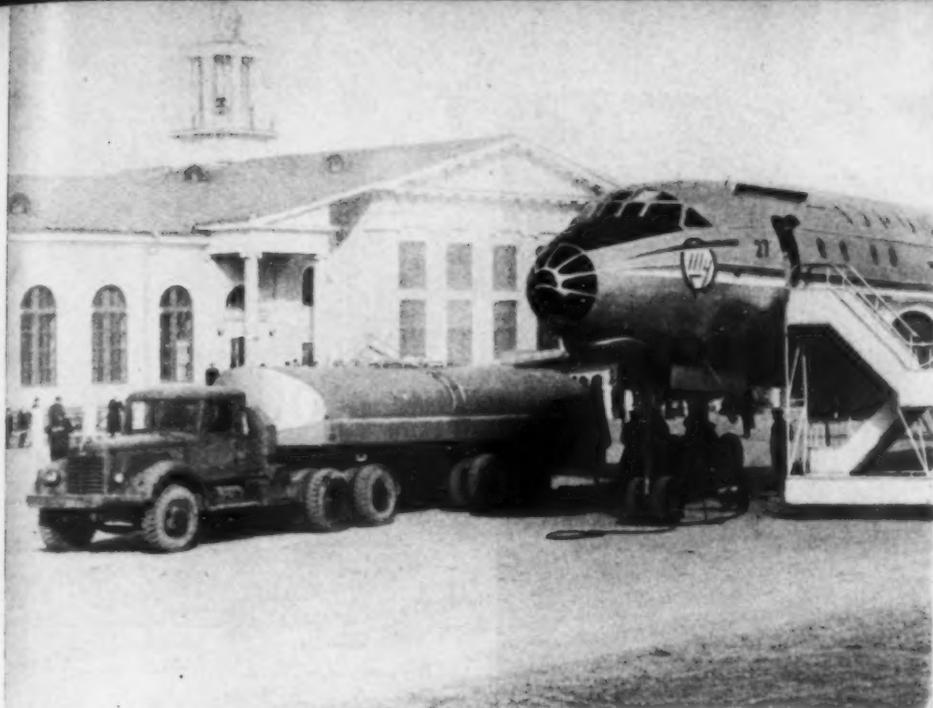
with several of our corn varieties and several grasses. According to Professor N. P. Neal, the fast-maturing Russian varieties are of great interest. At his request, we have sent him more than a dozen Soviet corn varieties and strains.

Closer cooperation between Soviet and American scientists in selecting corn will undoubtedly lead to advantageous results for both countries.

Soviet corn is not only highly prolific, but may match Iowa's bid to where it is tallest.



A ROUTINE FLIGHT

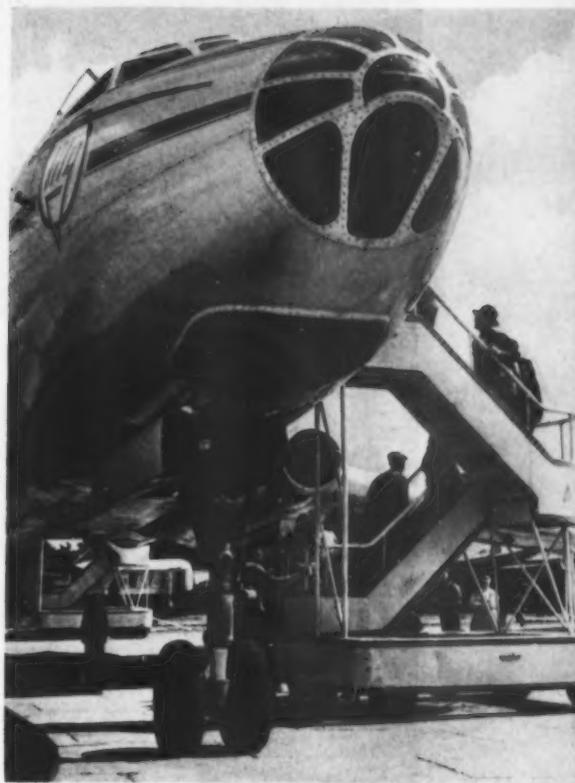


KHABAROVSK IN THE FAR EAST IS 5,000 MILES FROM MOSCOW AND ITS AIRPORT HANDLES ALL TYPES OF PLANES.

THE Vnukovo Airport, just about twenty miles from downtown Moscow, is one of the busiest air terminals serving the metropolitan area of the capital. Most visiting Americans and other foreign guests arriving by plane first set foot on Soviet soil at Vnukovo. The airport has been enlarged quite recently to take care of its increased traffic, and its runways have been lengthened to accommodate new turbojet and turboprop transports.

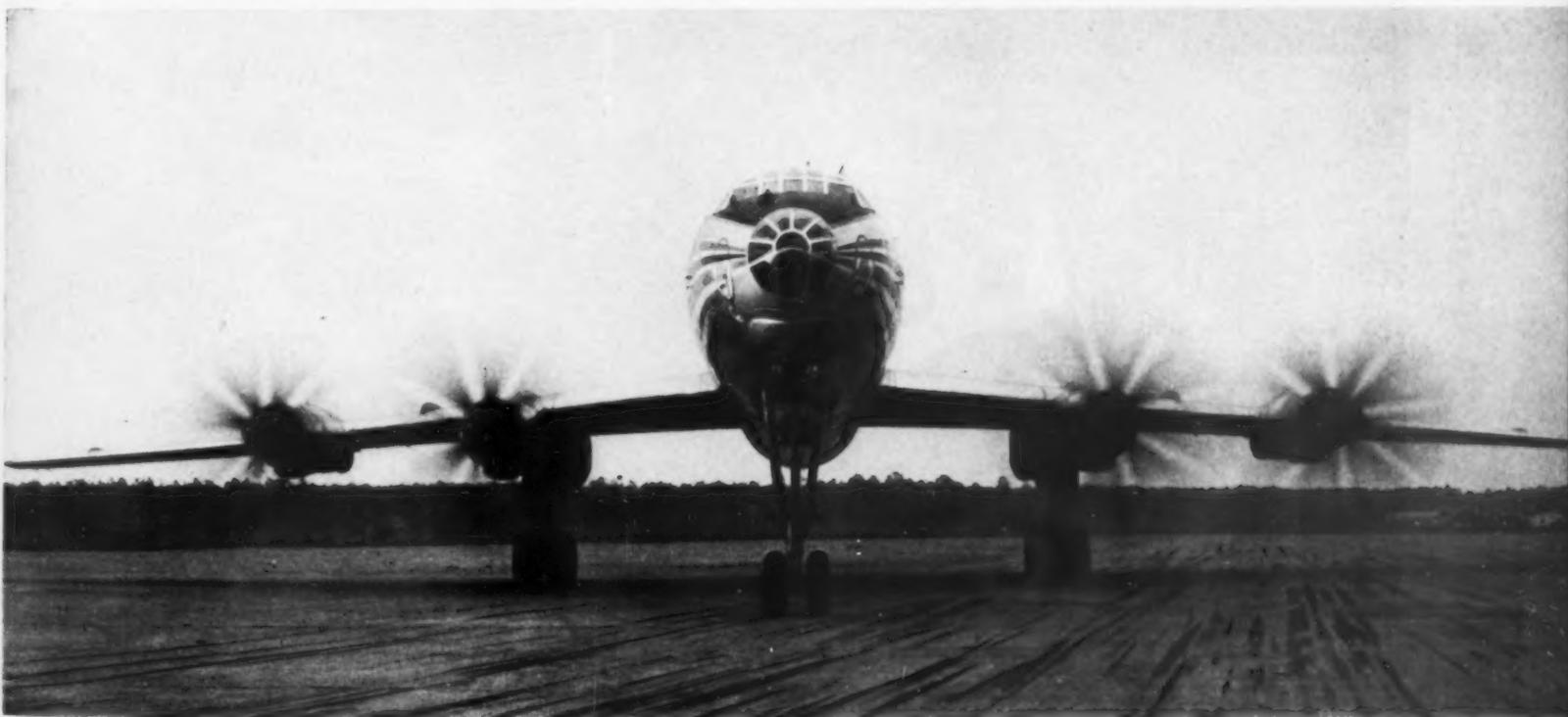
Among the many Aeroflot (Civil Air Fleet) passenger planes taking off from Vnukovo on a daily schedule is the TU-104A jet airliner that departs promptly at 5:30 each evening with its manifest listing Khabarovsk as its destination.

The trip to this Far Eastern city, which takes nine days on the railroad and approximately 38 hours in ordinary aircraft, is made in 11 hours and 35 minutes by the TU-104A's schedule. The air distance is 5,000 miles and the jet, cruising at the speed of about 600 miles an hour, makes only two stops. The first is at Omsk in Western Siberia and the second at Irkutsk in Eastern Siberia. All seventy seats in each of the TU-104A airliners are usually booked to capacity long in advance both at Moscow where the flights originate and at Khabarovsk for the return trips.



After moving from stand-by status to confirmed space, the passengers hurry aboard.

FARES ON TURBOJET AND TURBOPROP PLANES RUN ONLY SLIGHTLY ABOVE THE FIRST CLASS RAILROAD RATES AND THE SAVING IN TIME MAKES THEM A BETTER BARGAIN.





A ROUTINE FLIGHT

Pilots of the TU-104A jet airliners traveling on a 5,000-mile route between Moscow and Khabarovsk very seldom deviate from the scheduled time of 11 hours and 35 minutes.

Radio officers aboard are busy with weather, air traffic and other information that helps ensure the safety of every flight.





A pleasant stewardess serves piping hot meals that are quite welcome for the long distance travelers.

TU-104A transcontinental airliners have their own chefs who prepare individual servings.



Comfortable reclining seats are as conducive to a sound nap as letter writing or reading.

This little tot makes friends with everyone aboard for himself and that big new teddybear.



The smooth-riding plane has baby asleep in no time, but when he wakes the stewardess will aid mother.



Vladimir Kuzin, holder of the 1958 USSR championship for the 15-kilometer run.

By Venedict Kamensky
Coach, USSR Ski Team

Fyodor Terentiev placed second in the 4 × 10-kilometer relay for the 1958 world title.

THE BEST of the world's skiers are to converge on Squaw Valley, California, in February for an international match that will provide coaches and public alike with a realistic preview of the 1960 Winter Olympic Games scheduled over the runs of the newly-completed American center.

Offering a varied program of contests including flat-racing, the Nordic combination, jumping and slalom events, the Squaw Valley meet will find Soviet skiers among the challengers in this highlight of the current winter season.

Because of the adoption of improved styles and training methods along with more strenuous workouts and practice techniques, the times scored in ski events over the past few years are getting better.

Soviet entries will participate in all of the scheduled events, and the variety offered for each of the classes will provide a wonderful opportunity for both the fans and experts to make some definite conclusions concerning the strength, skill and form of all contestants.

The Soviet Union will field a squad of well-conditioned, all-round skiers. For instance, there is Vladimir Kuzin, who won the world title in 1954 and also triumphed in the 1956 Winter Olympic Games. Then there will be Pavel Kolchin, winner of the 1958 international meet at Holmenkollen who also took a championship in the last Olympics. The Soviet squad includes Anatoli Shelyukhin, the USSR champion of 1957; Olympic champions Nikolai Anikin and Fyodor Terentiev; plus a batch of promising youngsters and, of course, a full team of entries in the women's division.

SOVIET SKIERS



Soviet skiers started training much earlier this season in preparation for the meet at Squaw Valley. All the leading skiers participated in the inaugural races last November in which Pavel Kolchin and his wife Alevtina took most of the laurels. Pavel won the 20-kilometer race in 1 hour, 8 minutes and 3 seconds, while his wife negotiated the 5-kilometer run in 18 minutes and 46 seconds, which was considered good time for so early in the season.

Since making their international debut in 1954 at Falun, Sweden, Soviet skiers have had their share of successes and a few disappointments. At last year's world championships in Lahti, Finland, the main contest was between the Soviet, Finnish and Swedish teams. At first glance it seemed that there was little difference in the styles of the Soviet and Finnish skiing techniques. The general movements seemed to be the same in almost all phases. But there were differences in detail, and probably the main point was that the Finns executed their movements more freely and easily than the Soviet entries. Thus they were able to conserve strength.

But the style of Pavel Kolchin is regarded as exemplary in the Soviet Union. And there are no obvious or serious faults in the skiing styles of Nikolai Anikin, Vladimir Kuzin, Nikolai Galiev or Fyodor Terentiev. But why, then, have Soviet athletes not made better records?

There is the possibility of excess tension. The speedsters form the dominant body of skiers and consequently pay little attention to relaxing themselves. And many athletes try to avoid races over 50 kilometers long on the eve of important matches, believing that it would hurt their



Rosa Yeroshina is the 1958 world champion in the 3 x 5-kilometer relay and the 1957 USSR champion.

KROSPECTS



Alexander Filatov holds the 1958 USSR titles in the grand slalom and also in the triathlon.



Alevtina Kolchina won two world championships in 1958—in the 10-kilometer run and in the 3 × 5-kilometer relay.



Pavel Kolchin was the 1957 USSR champion for the 30-kilometer race and won the Holmenkollen events in 15 and 50 kilometers.

Soviet Ski Prospects

speed and lead to fatigue. But the experience of last winter proves that just the opposite is true. The Finnish stylist Hakulinen, who appears in marathon races more often than our skiers, won the 15-kilometer run in Lahti.

As in every other sport, it is not only the top-notchers who score in international competitions. There are many young skiers in the Soviet Union with a promising future. They are priming themselves for the Winter Olympics and are not afraid to take on the champions.

At the last Winter Olympics we found many of our young jumpers were making excellent distances—82 to 83.5 meters. But their inability to stay on their feet at the finish sent them to last place. There was the case of Tsakadze, whom the *New York Times* called the world's greatest jumper until he comes within 10 feet of landing. The *Times* gives him

two years to learn how to land properly and then predicts he will be unsurpassed.

Our speedsters were no more successful than the jumpers. First of all our squad was chosen to run before all their main rivals. As a result the rival squads could adjust their pace to exceed that of the Soviet runners.

At the start of the men's relay race, Fyodor Terentiev was accidentally struck in the eye. Then Pavel Kolchin broke his stick while running. Despite these mishaps, four Soviet skiers were among the six best performers in the 30-kilometer race and the Soviet team won the 4 × 10-kilometer relay—the most important race of the games.

Members of the winning quartet were Fyodor Terentiev, Pavel Kolchin, Nikolai Anikin and Vladimir Kuzin. In the women's division, Lyubov Kozyreva won the crown and the world title for the second time in the 10-kilometer run.

We shall attempt no forecast here for future events. But this is certain: there will be many new names on the honor roll in the downhill racing contests in Austria, on the level courses in Finland and at Squaw Valley.



THE SKI JUMP ON LENIN HILLS IN MOSCOW IS ONE OF THE FAVORITE GATHERING PLACES FOR BOTH PARTICIPANTS OF THIS POPULAR WINTER SPORT AND SPECTATORS.

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SUNDAY IN MOSCOW'S IZMAY HILLS. See picture story on page 22.

