sputnik

MONTHLY DIGEST

October 1968

3/6

AUSTRALIA	45c	DENMARK	Kr 3 70	ITALY	L320	PAKISTAN	R 2 00
AUSTRIA	S 12	FINLAND	Mk 2 10	JAPAN	Yen 200	PHILIPPINES	P 1 75
BELGIUM	Frs 25 0	FRANCE	NF 2 50	LEBANON	Pl 150	SOUTH AFRICA	35c
BRAZIL	U S 50c	W GERMANY	Dm 2.00	MALAYSIA	$1 65	SWEDEN	Kr 2 60
BURMA	Kt 2 00	GREECE	Drs 15 0	NETHERLANDS	Fl 1 50	SWITZERLAND	Fr 2.20
CANADA	55c	INDIA	R 3 50	NEW ZEALAND	40c	U.A.R.	Mls 175
CEYLON	R 2 50	ISRAEL	IL 1 75	NORWAY	Kr 2 60	U.S.A.	50

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COVER: Sophia Mtyrva, amateur dancer, photographed by F. Grinberg and B. Kaufman. Sophia is a weaver at the silk mills at Benderi, Moldavia. For more about Moldavia, see "Land of Song and Sunshine", starting on p. 84.

Photo and picture credits: Fred Grinberg and Boris Kaufman (pp. 84-101), Dmitri Donskoi (32-39), Nikolai Manuilov (43), Anatoli Zhigailov (102-111), Miroslav Murazov (112-121), Semyon Ozersky (124-127), Mark Gankin (172-175).

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LETTERS TO THE EDITOR

The Amazon

I am greatly inspired by your news and comments. Mme. Elena Petushkova (*Sputnik,* June, cover) seems to be the materialization of that dream haunting every male, especially if he happens to be a horseman.

H. Heyer, Kingstone, Sauth Australia

Visual Aid

I think your magazine is fascinating as pleasure reading and an invaluable aid in school work. Especially interesting are your articles on the theatre and the ballet—two of my principal interests.

I have only one complaint about your magazine: it is far too short.

Helen G. Hester, New London, Connecticut, USA

Russian Girls

Sputnik holds pictures of Moscow before my heart. I never got as far as Moscow. What a pity! Russian girls are so adorable. They possess what psychologist Erich Fromm terms tenderness. What would Russia be without them?

Canrad Linden, Launcestan, Tasmania, Australia

Silver Jewellery

In your February, 1968, edition of *Sputnik* you featured an article on Manaba Magomedova, and her Georgian silver jewellery. I thought these were most beautiful.

Greta E. Jensen, Mount Colah, Australia

Cooking

Everybody in my family is interested in some section of your book. My mother likes and enjoys your cookery section.

N. Davidson, Blackrock, Eire

Photos

I very much liked the photograph of ballet dancers Maya Plisetskaya and Nikolai Fadeyechev in "Rhythm of Happiness" (May, 1968, issue) and the one by Boushkin entitled "Thunderstorm" in the January, 1968, issue. I am delighted by them.

Tatyana Dikova, Safia, Bulgaria

Voice of the Brain

Scientists can be fooled just as easily as anyone else. This explains why so many eminent scientists and thinkers, such as Sir Oliver Lodge and Sir Arthur Conan Doyle, believed in spiritualism.

K. S. Jaffrey, Townsville, Australia

The Ustinovs

Thank you very much for publishing the article "Meet the family" by Elena Korenevskaya in the June, 1968, issue. I hope that Mr. and Mrs. Ustinov did not mind having their family life made public.

B. Stanway, Guildford, Surrey, England

Diamond Treasury

I would like to express my appreciation of the article in May *Sputnik* which dealt with the Diamond Treasury—especially the diamond regalia of Catherine the Great. The pictures are superb in colour. Congratulations to the photographer.

Luise Sheridan, Los Angeles, Califarnia, USA

Continued on Page 5

LETTERS TO THE EDITOR

Pen-friends wanted

World-wide Socialist pen-friends wanted to exchange information and criticism of each other's country.

Phillip Rendle,
17 Oxford Avenue, Peverell,
Plymouth, Devon, England

I am twenty years old and I would like pen-friends all over the world.

Janet Hewison,
3 Palmerston Court, Palmerston Road,
Westcliff on-Sea, Essex, England

I am fond of having pen-friends from other countries, and would like to write to an English-speaking woman. I am middle-aged and a housewife.

Mrs. C. Gamblen
13 Eversley Crescent, Leigh Park,
Havant, Hampshire, England

Twenty years old, I wish to correspond with girls everywhere. A reporter, my interests are varied and include driving, art, poetry, reading. I know French.

Alastair C. Beaton,
166 Brickfield Rood,
Stonehaven, Kincardineshire,
Scotland AB 3 2LS

I would be very thrilled to have some pen-friends. My main interests are literature and classical music and I can speak—apart from English—Italian and German.

Helen Gregory,
Library, Co-operative P.B.S.,
New Oxford House, High Holborn,
London W.C.1, England

I am 16 years old. I know Irish, English, some French and Spanish. My hobbies are sailing, swimming and reading.

Stella Walsh,
30 Main Street, Dungarvan,
Co. Waterford, Ireland

I can speak French, Russian and English. My hobbies are pop music, walking and climbing. I am nearly 16 years old and I am at school. Preferably my pen-pal should live out of the UK and countries nearby.

Barbara Saul,
178 Stourbridge Road, Bromsgrove,
Worcestershire, England

I would like to have pen-friends in Russia and Europe. My interests are: reading, chess, arguing and procrastinating. I know limited French and am trying to teach myself German and Russian.

Mark Peatty, (16),
31 Roberts Road, Kelmscott,
Western Australia 6111

I am a 15-year-old student and I would like to have pen-pals from Europe and all over the world. Letters in English.

Terence Tay Yew Soon,
8 Sing Too Walk,
Singapore 8

I am a medical technology student, 18 years old. My hobbies are: collecting friends all over the world (by means of pen-pal writing), stamps, coins, postcards and watching television.

Emelita B. Ruidera,
152-D Jose Rizal Street,
Project 4, Quezon City,
Philippines

We desire to have pen-friends in foreign countries.

L. Tambu (a student of engineering, 17 years old), c/o S. A. Lakshmanan, 164 C Big Bazaar Street, Tiruchy-8, Madras State, India

S. Ananthakrishnan, (studying Xth Standard, 16 years old), c/o S. A. Sriramulu, 56-B-T Diamond Bazaar, Tiruchy-8, Madras State, India

LETTERS TO THE EDITOR

I am 36 years old and stores manager, Co-operative Wholesale Establishment, Colombo. My hobbies are reading literature on current world affairs, photography, correspondence and stamps.

Justine Assella,
"Kandewatte", Kitalangamuwa,
Galapitamada, Ceylon

I am 17 and wish to correspond in English. Interested in crosswords, books and pop music.

Viara Petrova,
Gorni Bakoitzi 10,
Gabrovo, Bulgaria

I am 19. My favourite occupation is drawing, but I also like good books, films, music and the theatre, and am fond of tennis. I write in English, Russian and Bulgarian, and am studying Italian.

Baika Blogaeva Lazanova,
Baulevard "Al. Stambaliiski" 89, vh.G,
Safia 3, Bulgaria

I want to have many friends in different parts of the world. I am 16 years old and I am a student in the English Language School in Sofia. I know English, Russian, Bulgarian and a little bit of French.

Valentina Taskova,
Hypodruma 7, Safia-12,
Bulgaria

I am 18. I am interested in stamps, photography, English and music. I can correspond in English, Russian and Bulgarian, and would be willing to try in German.

Angel Rusev,
"Zdravets", Bl. 77, vh.G,
Ruse, Bulgaria

I like good and clever people. I should be grateful if anyone who considers himself (or herself) clever would write to me in English or Russian.

Ivan St. Shishkov,
Baulevard Bessarabia 15,
Sofia 17, Bulgaria

Please address letters to: The Editor, Sputnik Magazine, 2 Pushkin Square, Moscow, USSR

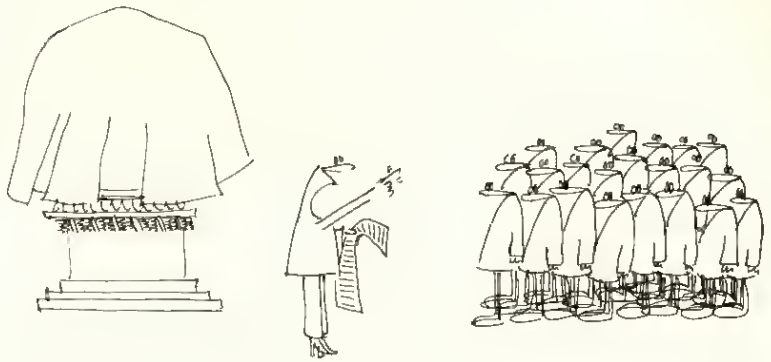
DON'T RUSH YOUR RUSSIAN

If Chekhov or Tolstoy turned up in Moscow today, he would probably find it a bit difficult to understand the way we talk. Why? Because as life has moved on, the Russian language has absorbed thousands of new words and idioms.

Want to be with it? Why not! There'll be "Russian For You" in SPUTNIK, starting next month.

This new series will concentrate on the modern language spoken today, on proverbs, sayings and idioms, including Russian slang—but it will do it in easy stages. Read it—and grow language-wise.

Mr SPUTNIK



Drawing by Vadim Konopliansky

about Soviet schools

"What is the system of primary and secondary education in your country?" ... "What kind of schools do Soviet children go to?" ... "Are all the schools on the same pattern, or are there any variations?" ... "How many years' schooling do children have, and what happens to them at the end of it?" ... "Are there any special national features of the schools in different Soviet republics?"

These and similar questions are often sent in by readers. To answer them, here is the first of a series of articles on Soviet education.

by Elena KATASONOVA, from APN NEWSLETTER

We have 206,000 general education schools, with 49 million pupils, in our country. These are the foundation of our education system.

They combine primary and secondary education. Primary education is for children from seven to ten. They are taught the three "R's", along with singing and drawing, and are introduced to elementary natural science. They have one teacher for most subjects.

In the next stage, secondary education, children spend seven years studying the fundamentals of science and learning under various teachers.

Each form has its room, and secondary schoolchildren also have physics and chemistry laboratories, gymnasiums, and other rooms equipped for special subjects.

A school period lasts 45 minutes, and there is a five-minute break in between. After the second period there is usually a 15-minute break, during which the children have their "elevenses".

The school year begins on September 1 and ends in May. In the secondary school, children are taught their own language (for children in the union republics and autonomous regions Russian is extra to this), a foreign language (English, French or German), literature, mathematics, history and social science (an introduction to philosophy), geography, biology, physics and astronomy, chemistry, art and music. They also go in for sport and learn to do some productive work.

What is behind this idea of productive work? In 1958 the USSR Supreme Soviet, the highest legislative body, passed a law entitled "On strengthening the links between school and life and further developing the education system in the USSR". This law was to give rise to a whole chain of reforms. But we shall come back to that later on in this article.

All schoolgirls and boys have to take examinations at the end of the eighth and tenth years of schooling. In the eighth-form exams tbe examiners consist of one of the teachers and two assistants, while the tenth-year pupils are examined by a State commission which includes representatives of the city or district education department.

Examination work, like term work, is marked with a five-point

system. Five is the maximum and three is the pass line.

On leaving school a pupil receives a School Certificate, a document showing that he has had eight or ten years' schooling. Those who get maximum marks in every subject are presented with gold medals, and if they receive a four instead of a five in one subject they are awarded silver medals.

This is a general outline. Now for some details about the reforms carried out or in process of being carried out.

The 1958 reform

Summer, 1953, meant a lot of worry for a lot of people. It was the first time that youngsters had been so sharply confronted with the question of what to do on leaving school at the end of a ten-year education if they did not get into some college or university.

It was difficult to get into any higher educational establishment. The number of applicants far outstripped the number of places available. And it was clear that the situation would remain unchanged for another five or six years.

The school-leavers that year were youngsters who had been born in 1936. For various reasons the birthrate was high, and it remained high until 1942.

But why should all school-leavers have to go on to higher schools? Every single one of them, regardless of ability or aptitude? Nobody knew the answer. All they knew was that to fail to get in was a tragedy both for the girl or boy and for the parents, and for the entire clan of relatives.

It was the thing for everybody to do on leaving school. Furthermore (and this was probably the main reason), schools prepared young people solely for this end: the pupils ended up by being stuffed full of all kinds of knowledge without much idea of how to apply it.

So in 1953 many did not get into colleges or universities. Society had to deal with the problem of what to do with the "failures". It was an economic, social and moral problem.

First of all, the youngsters themselves had to be convinced that no terrible tragedy had taken place; that at 17 they were still young, and that if a person was really keenly interested in knowledge, it would not run away from him.

Press, radio and TV all helped to get this point across. At the same time special arrangements were made at all kinds of enterprises to take in school-leavers. Boys and girls began to learn on the job, at many kinds of courses and at specialised vocational schools.

As far as higher schools were concerned, instead of priority going to gold and silver medallists, as in the past, it went to those who had had two years' experience of work—even if they had lower marks than other applicants. Medallists still had a concession the following year—they had to pass examinations only in two main subjects, but thereafter they took the same examinations as everybody else.

A further year was added to the ten-year school, the purpose of the eleventh form being to supplement academic learning with concrete knowledge.

The 1958 law dealt, among other things, with polytechnical training. Handwork and the cultivation of school plots was introduced into the programme for primary schools, and secondary education was expanded to include, for everyone, practical experience of operating machinery, electrical engineering and the fundamentals of farming, and also practical work in production.

Before long, however, it emerged that instead of the changeover giving pupils a knowledge of the scientific basis of production and the principal branches of industry, some schools had imperceptibly slipped into a position where they were simply providing vocational training (sometimes they even trained the children in an industrial trade). It was felt that such training would help a boy or girl to choose a trade or profession.

But how does it help a youngster to make a choice if the whole form studies, for example, carpentry?

Furthermore, girls are not usually particularly interested in such a trade (since the mid-fifties there has been co-education in the USSR). Nor can it attract all *the boys—no more can any other trade or profession!*

Another thing was that training in practical skills often took place at the expense of basic subjects. Do what you like, but nobody is allowed to set the children more than six lessons a day.

For the time being, it is true, the existence of the eleventh form saved the situation in a number of cases, but at the same time it created a number of additional difficulties for the boys. Some of them would celebrate their eighteenth birthday before the time came to enter higher school, and would so become eligible for call-up. Those who were admitted to college or university before they were 18 would be temporarily exempt from military service.

Eventually, the idea of trade training and the 11-year school had to be abandoned. There remained the idea of polytechnical training. But it had to undergo substantial correction.

Each school still has the right to train pupils in a particular trade, but now this has to be done at optional courses; that is, outside the framework of a general technical education, and not instead of it.

Practical knowledge

In addition to education in the humanities, pupils are taught about the construction and operation of machines, the generation, transmission and use of electricity, and the scientific basis of mechanical and chemical technology, etc.

Pupils get practice in designing, in the machining of metals, in plant cultivation and the care of animals.

It is acknowledged that general subjects which reveal the scientific foundations of production play a vital role in polytechnical education,

and therefore get special attention.

At present, then, we have compulsory eight-year education (in 1970 it will be ten-year) in our country. It is the same for everybody in so far as the right to education is concerned.

But does that mean that the education system has to provide precisely the same general knowledge in all subjects for every pupil, regardless of his abilities and aptitudes?

Heated debate

So we get on to the vexed question of differential education.

In the 1958-59 school year, a Moscow school divided its senior forms into three groups: physico-mathematical, chemico-biological, and arts.

The youngsters were allocated to these three groups in accordance with ability and preference. Within each group it soon became clear that there were subjects that the pupils would like to study more deeply. So optional courses were introduced.

Within the groups there was a further differentiation—not according to subject, hut according to ability. The pupils were given tasks of varying complexity, and in addition to the basic material there were supplementary prohlems of greater difficulty.

The ideas developed at this school, especially that of optional courses, gradually spread to others. This year optional courses are availahle everywhere.

This is only natural. Who would object to them? They are, of course, necessary.

There has been no argument about streaming in primary schools, for our education experts consider that at such an early stage this would doom a child to a one-sided development and would deprive children of their equal opportunities for further education.

There are, it is true, exceptions to this general rule—but what rule gets by without exceptions?

We shall say more about that later.

So there is differentiation in the seventh to tenth years at school; that is, for youngsters hetween 14 and 17.

A heated debate immediately arose hetween solid men of science, teachers, agitated parents and, finally, journalists.

There is still bitter fighting going on between the partisans for and the opponents of the new system.

Now, incidentally, "new" is only a courtesy adjective. Neither the system nor the controversy raging over it is new to many countries (in particular, Britain). Nor are they new for our country.

Back in 1920 Anatoli Lunacharsky, People's Commissar for Education, emphasised that the principle of a single school did not mean com plete uniformity; that differentiation within the school was a means of directing the child's propensities, which made possihle maximum flexibility in school life without an ahrupt divisi'n into two periods—the first with no specialisation whatever, and immediately after that a choice of trade or profession.

A numher of quite determined attempts were made on these lines in the Twenties and Thirties. In the Sixties the advance was made on a united front.

Those in favour of differentiation in senior forms hold that:—

1 In our time it is impossihle to he specialists on all (or even many) questions. So much information and cultural "equipment" has been accumulated hy man that nobody can get anywhere unless he makes a deep study of a particular field of knowledge.

2 The early discovery of ahility means that a gifted child can be attracted to science without wasting valuable time. The age at which serious scientific work is begun is falling rapidly. Not many years ago, it was considered that the time to start scientific research was in the third year of higher education. Today, not only do first-year students conduct research, but school pupils carry out independent research work and even take out patents for their inventions.

Why does a future linguist need such a suhject as, for instance, algehra in the way a mathematician-to-be needs it? Anyway he will forget many, if not all, of its intricacies right after the school examinations.

As for the future mathematician, is it enough for him to get the same knowledge of maths as the linguist-to-he? Later on he will be rushing to catch up on what he could easily have studied at secondary school. Won't it be a matter for regret, later, that he spent so much time swotting up all the details of the Crusades?

Isn't that convincing enough? It ought to be.

But now hear the other side:—

1 Youngsters of 14 are not usually ready to choose their trade or profession. Furthermore, practical experience has shown that even school-leavers are often at a loss on this question.

A youngster who mistakenly chooses the arts at school would, of course, have the right to enter a technical college or faculty of a university later on (nohody proposes to rob him of that right). But would he stand much chance against those who had heen on the technical side?

2 Won't differentiation and greater specialisation lead to lower standards in the general educational level? Won't it mean the replacement of our present general education school hy schools specialising in physics and technology—after all, there is a greater demand for specialists with a technical education.

The controversy goes on.

Each pro and each con is backed up hy solid argument. And each one has its partisans.

We already have our first mathematics schools and our first schools with a bias towards a particular language.

It looks as though differentiation has already estahlished itself to some extent, whatever its opponents say. So perhaps there is no need to he afraid of it? Perhaps it is simply a question of how differentiation is organised, of whether a reasonahle balance is maintained hetween the arts

and the exact sciences, of whether teachers are able to give the more romantically inclined the essential minimum of technical knowledge, and to the physicists a minimum knowledge of the arts. Time will show...

That's enough on that subject.

After all, schooling in the USSR is not limited to general and specialised schools.

Apart from the schools already mentioned, there are specialised technical schools, vocational schools and schools for army and naval cadets.

Vocational schools accept eighth-year pupils and turn them into skilled workers or junior technicians for all branches of the economy, in a total of more than 700 trades. In 1967, for example, a million specialists were trained by such schools.

The period of study depends on the degree of skill required for a particular trade, and varies from one to three years in the towns, and from one to two years in the countryside.

In recent years the question has been raised of these schools completing the general secondary education of their pupils, and not merely giving them vocational training.

This year boys and girls leaving more than a hundred of these vocational schools received their School Certificate.

A youngster who has got to the seventh or eighth form at a general school may complete his general education at a specialised technical school (a complete secondary education is required for entry into a technical school for certain specialist subjects). At such schools the pupil may go on with a general education and at the same time learn a trade.

A technical school gives its students a higher level of skill than a vocational school, and accepts entrants between 14 and 30 years of age. The course lasts from three to five years as a rule, but most technical schools have special groups for secondary-school leavers who attend for one-and-a-half to three years.

In the past few years the number of technical schools has increased substantially. The economy, it has been found, requires three to four specialists with technical school training to every expert with higher education. So far the proportion is two to one.

Special Schools

Music, ballet and circus schools, where children are admitted on passing entrance tests (sense of rhythm, movement, etc.) provide special training beginning with the first form, alongside the general subjects.

Streaming in the junior forms here is quite justified and is even necessary, because such specific fields as music and dancing require training from an early age.

The Suvorov and Nakhimov schools (named after Field Marshal Suvorov and Admiral Nakhimov) exist to train boys for the army and navy, at the same time giving them a general secondary education. They were instituted during the war (in 1943 and 1944), primarily for sons of soldiers and officers killed at the front.

These schools are open to children of ten or older who have finished primary school. They are boarding schools, and the children's board, lodging and other living expenses are borne wholly by the government. After going through such a school a youngster attains a standard qualifying him for enrolment at any college in the country.

There are also schools for physically and mentally handicapped children. Education at these schools is compulsory and tuition is free, just as at any other school. An important problem here is to choose the right school for each handicapped child. This is decided by a special commission of doctors and experts on teaching defective children.

Of course, no differentiation is possible here. It is necessary for every child to get individual attention and this is precisely what happens at these schools, for only in this way can physical and mental defects be corrected or compensated for.

There are many problems being studied by the Defectology Institute of the Academy of Pedagogical Sciences and by individual teachers of vast experience. One of them is how to improve the teaching process by using the latest medical achievements and modern educational aids.

Also very important is the problem of establishing close links between family, school, kindergarten and nursery in bringing up and educating children.

And finally, the right scientific approach is yet to be found to vocational training, as the choice of trade or profession for a child, depending on the nature of his handicap, is of crucial importance.

Adults can take evening and correspondence courses, specially set up to enable working people (at 16 and over) to complete their secondary education.

Schools for adults

A start was made in this sphere in 1917, when special three-month courses were set up to eliminate illiteracy among the adult population. Soon afterwards, ten-month courses were opened, and then followed schools for semi-literate people that covered the entire primary school curriculum.

In later years evening schools (eight and ten forms) were instituted. In 1937 correspondence schools were organised and in 1944 special evening and correspondence schools were opened for the rural population.

The important thing about all these schools is that their academic standards are as high as those of the ordinary day-time schools. The only major distinction here is that at the evening schools classes are held on certain days of the week, while the students of correspondence schools and courses gather only at examination time and for consultations with their teachers.

One must not ignore the fact that the pupils are working people, who are often no longer very young and, apart from that, are not always sure they can cope with the secondary school programme.

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sputnik

SPOTLIGHT

by Vladimir POZNER

Vladimir Pozner, whose column "Sputnik Spotlight" will ragularly eppear here, is a young journalist end e translator of English and American literature. He has travelled extensively in the Soviet Union and abroad end mekes his home in Moscow.

When, on the eve of pay-day, which for some strange reason always coincides with a personal financial crisis, I soberly try to analyse where last month's money went, I solemnly promise myself to stop taking taxis.

Not that they cost that much—a mere 10 kopecks per kilometre plus 10 kopecks for services. But it all depends, I suppose, on the number of kilometres one covers, and I seem to take in some 30 roubles' worth monthly.

So, I vow to stop and for at least two days I gaze with utter contempt at the winking green eye of the checkered-body Volga saloons. But on the third day. . . . Well, let's consider this one of my lesser vices and forget about it. What's more, every cloud has its silver lining: were it not for this weakness I would never have had the experiences I wanted to write about in this month's "Spotlight".

It may be because one is allowed to ride up front with the driver; then again, the reason may be of quite another order, but the fact remains: Moscow cabbies are among the world's most articulate individuals. They are willing—and capable—of discussing any subject from the Sterling crisis to Dynamo's latest Soccer triumph over Spartacus. At any rate, I've met some whose oratory would have put Mr. Shaw's Doolittle to shame.

The Moscow cabby's approach is direct and concise, his manner is personal and his sarcasm, when turned to an adequate subject, is devastating. Here are a few recent examples.

TAXILOGUE 1

I hailed a cab, got in, gave the address and settled back for a comfortable ride.

"You are guilty on two counts!"

I looked at the driver, slightly startled. Age somewhere around 50, super bushy eyebrows, pugnacious jaw.

"Oh. . .?" I was playing safe.

"On two counts," he repeated. "First, you were standing in the street, not on the pavement. You should be fined for that. Agree?"

"Yes, I suppose you're right," I meekly replied.

"Second, you could have said Hello to a man twice your age when you got in, couldn't you?"

Slightly nettled, I answered, "Age doesn't have anything to do with it"—and promptly received the broadside I had left myself wide open to:—

"All the more reason not to forget one's good manners!"

"I'm sorry."

We drove on in silence for about three minutes.

"Who is going to be the next American President?"

This was something I wasn't ready for, but at least a subject not foreign to me. I took a deep breath while arranging the pros and cons of my short lecture. "To begin with. . ."

"Humphrey, that's who," he interrupted with finality.

This was too much. "And why, may I ask?" I said, pouring enough acid into my voice to fill a bathtub.

"Rockefeller and Nixon are both out," explained the cabbie. "One because of a divorce, the other because he lost a presidential election. Americans don't like losers or divorces, though I don't know why. McCarthy is out because he's an intellectual and Americans don't like intellectuals. So, who does that leave us with? Humphrey. Understand?"

I understood.

"Fine. And here is where you get off."

I thanked the driver, paid my fare, made extra-sure to say goodbye and wish him the best of luck, and got out.

TAXILOGUE 2

The whistle blew, sharp and commanding. The taxi came to a screeching halt and the driver got out to discuss matters with the militiaman. A few minutes passed, then the driver got back in, viciously slammed the door and off we went.

"What an outrage!" said the driver.

This was obviously my cue. "What happened?"

"He fined me one rouble for making a U-turn."

"But wasn't there a sign not allowing U-turns?"

"A sign. . . . sure there was a sign, but they put it up while I was in hospital: there wasn't one here before."

"You were in a hospital?" I asked, hoping to change the subject and almost sure of hearing some gruesome account of crash and collision.

"Two and a half months flat on my back. It all began with dizzy spells at the wheel. I checked up with the doctor and he sent me straight off to the hospital with high blood pressure. Well, they gave me shots of this and that, all kinds of medicine, dieting and so on. After 40 days I started getting up, but the medicos were not satisfied: they kept me there for 30 more days. Nearly drove me crazy! But that damn militiaman!"

"Excuse me, but did you pay anything for the 70 days in the hospital?" I asked naïvely.

The driver glanced at me in surprise. "Pay? Of couse not. Why should I pay?"

"Did you keep getting your wage during all that time?"

This time the driver took the risk of looking me full in the face for about five seconds before replying: "Say, are you a foreigner? I mean, your Russian is perfect, but judging from the questions you ask. . . ."

"No, I'm not a foreigner. I just wanted to say it sounds strange to hear someone grumble about paying a one-rouble fine after costing the tax-payer hundreds of roubles' worth of medical care. Don't you agree?"

The cabbie laughed, then said, "You know what? I never looked at it that way." Then, after a short silence, he added, "But the idiot didn't believe me when I said I had been in the hospital."

TAXILOGUE 3

The taximeter read 75 kopecks. I handed the cabby one rouble and prepared to get out.

"Just a minute," he said. "Take your change."

"Don't bother," I smiled.

"Do you know how to read?" asked the driver.

"What's wrong?"

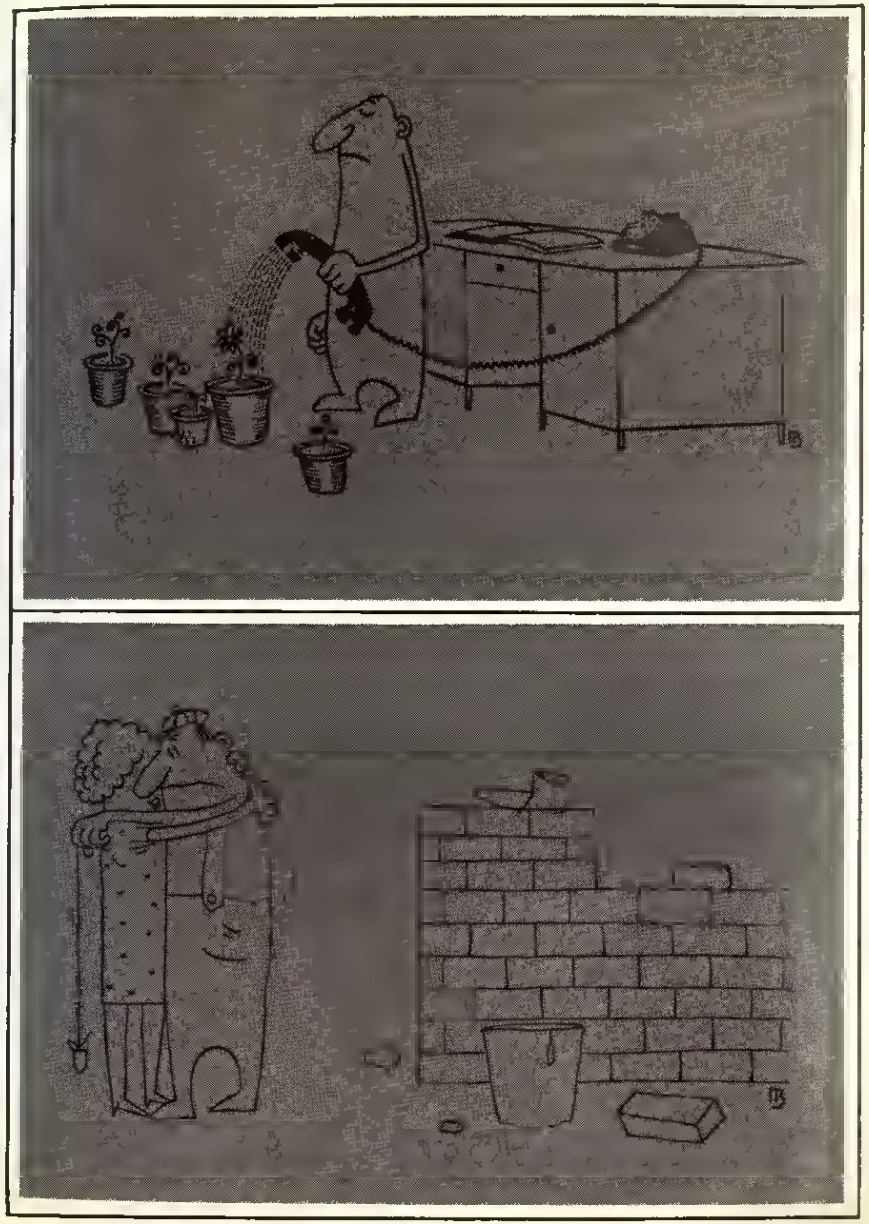
"Nothing, except that if you care to look at the glove compartment you'll see written on it, 'Pay strictly according to the taximeter'."

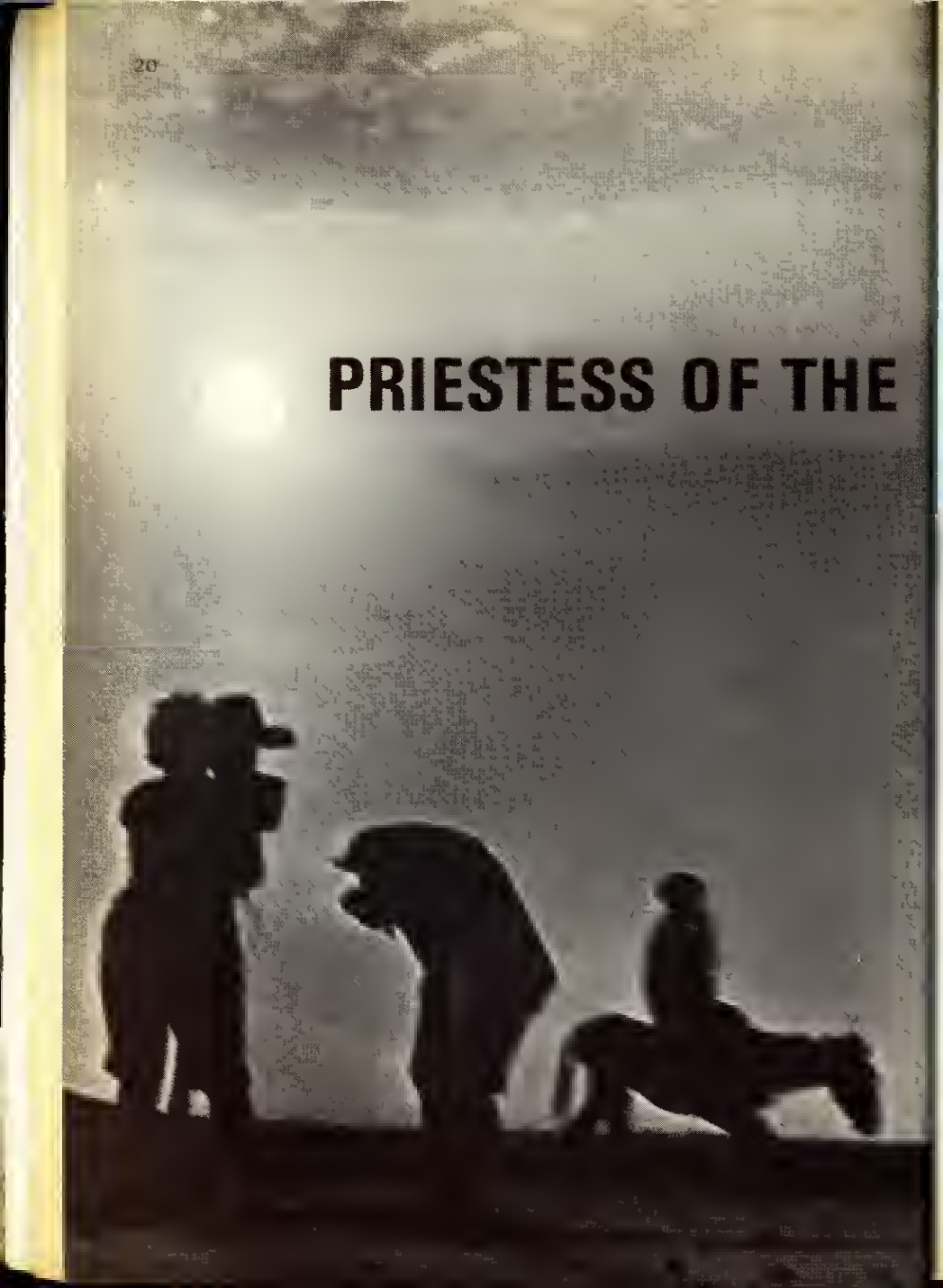
"I know about that, but I thought. . . ."

"Well, don't. Nobody tips you for your work, so why should you tip me for mine? We both work and that makes us equals. If you tip me, that makes you superior. So just forget about it."

★ ★ ★

When you come to Moscow, don't refuse yourself the pleasure of taking a cab. You'll learn a lot about yourself and life in general. Only learn Russian first. Our cabbies are not yet bilingual.





PRIESTESS OF THE KARA KUM

by Victor SARIANIDI
of the Institute of Archaeology,
USSR Academy of Sciences

In Central Asia, in the south of Turkmenia, archaeologists have discovered traces of an ancient civilization dating back to thousands of years B.C.

Beneath the rolling sands of the Kara Kum Desert, in Soviet Central Asia, twentieth-century men found a grave. It had been dug between 4,000 and 5,000 years ago, a last resting-place for a priestess who had been buried with due pomp and ceremonial and some rich paraphernalia, including gold rings and necklaces of agate, cornelian and lapis lazuli in gold settings.

By her side was a censer, and a silver seal engraved with a fantastic three-headed beast, and in her hand a terra cotta statuette.

The grave was uncovered by archaeologists at the end of summer 1966—just as they were getting ready to leave the site to avoid the rainy season.

Before they packed up, the head of the expedition, Vadim Masson, sent workmen to clear a slope that was to be excavated at a later date. There, just under the roots of the dried grass, about five inches below the surface, the sensational discovery was made.

At this tantalising point tbe expedition had to leave things until the following year.

For a considerable period a search had been going on for remains that might provide information about the

ancient civilizations of three cities which existed in this area—Namazga-depe, Ulug-depe and Altyn-depe.

Their sites had, however, yielded little that could throw light on the matter—one of immense interest because the cities were established 5,000 or so years ago, at a time when the most ancient known civilizations in the world (the Sumerian and the Indus) were in existence. Some mud huts of peasants and a few handicraft workshops had been found, but they were not old enough to be of value.

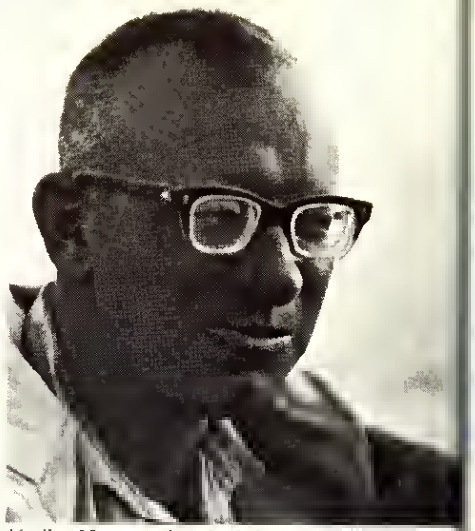
Then persistence had borne fruit, and on the northern boundary of Altyn-depe archaeologists came upon the remains of a mighty fortified wall, which proved to bave been built in tbe third millenium B.C. Tbe wall was so long that several years of intensive work were required to trace the outer limits of those parts which had been preserved. Even so, not all the wall was found, and nothing more of interest was unearthed.

Tbe discovery of the priestess witb the censer gave the archaeologists a tremendous lift. It was clear that such a person could only have existed, and such a burial taken place, in a highly stratified society. A new page in history was slowly being turned. But the archaeologists had to contain their excitement until the following spring.

At last the time came, and I was among the party that went out to the site some months later.

Archaeologists usually begin to

Continued on Page 26

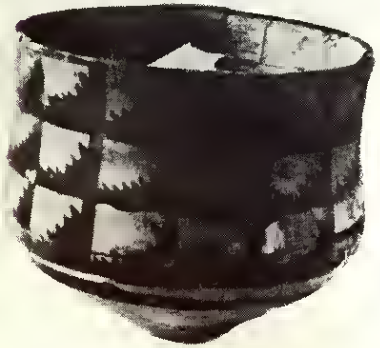


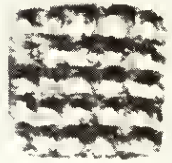
Vadim Masson, head of the expedition. Some of his 4,000-year-old discoveries are pictured here and overleaf.

Opposite: When these walls were whole, over 4,000 years ago, priestesses in magnificent vestments intoned incantations on towers rising from them.

Above: Russian and Tajik archaeologists and their helpers begin to get excited as the contours of an ancient temple emerge —the reward for some years of intensive work.

Below: A pottery bowl with an interesting design found on the site of the temple, another product of the kilns of Altyn-depe. Much of this pottery was used for trading with nomad tribes.





Among the other treasures of the lost civilization so far found is the terra cotta figure shown below, made by the potters of Altyn-depe in mass-production kilns in which the temperature reached 2,500 degrees Fahrenheit.

excavate where some indication of ancient life is visible on the surface —fragments of pottery or other artifacts, bones and so on. But we decided to abandon common sense and began digging on one small mound that seemed no different from any other. Almost at once we came upon the remains of several mud huts and, immediately by them, some brickwork.

Here we forgot about time. The wall grew before our eyes, extending down to the plain and out to the foot of a nearby hill.

After that we came upon another piece of very thick wall with pilasters. It was clear that the entire slope had been the site of a tower with a diameter of over six yards, built at about the time our priestess lived. These were the remains of a temple.

We had located the ziggurat, the most conspicuous feature of a Sumerian town—an artificial hill containing a temple and storehouses. Over 4,000 years ago these majestic walls loomed in the desert with crenellated parapets and tall towers, atop which burned the sacred fire.

Here priests in magnificent vestments once intoned incantations. Down below, at the foot of the hill, clustered the huts of the herdsmen, the tillers of the soil and the artisans.

The potters of Altyn-depe were highly skilled, using complex, two-tier kilns in which the temperature reached 2,500 degrees Fahrenheit. Here high-quality pottery was mass-produced, part of it for trade with the nomads.

Archaeologists in the southern Kara Kum Desert had found a number of clay statuettes of female figures, on many of which ears of grain or trees had been scratched right into the wet clay, as was commonly done by ancient farmers. But one figure had on it an eight-pointed star, the ancient symbol for deity, or heaven, in one of the oldest languages on earth, Sumerian.

Some were marked with crosses, triangles, signs resembling the letter "k", a total of more than 20 symbols. A number of these represented particular gods. Others looked like the characters of Sumerian writing. The statuettes dated from the third and second millennia B.C.

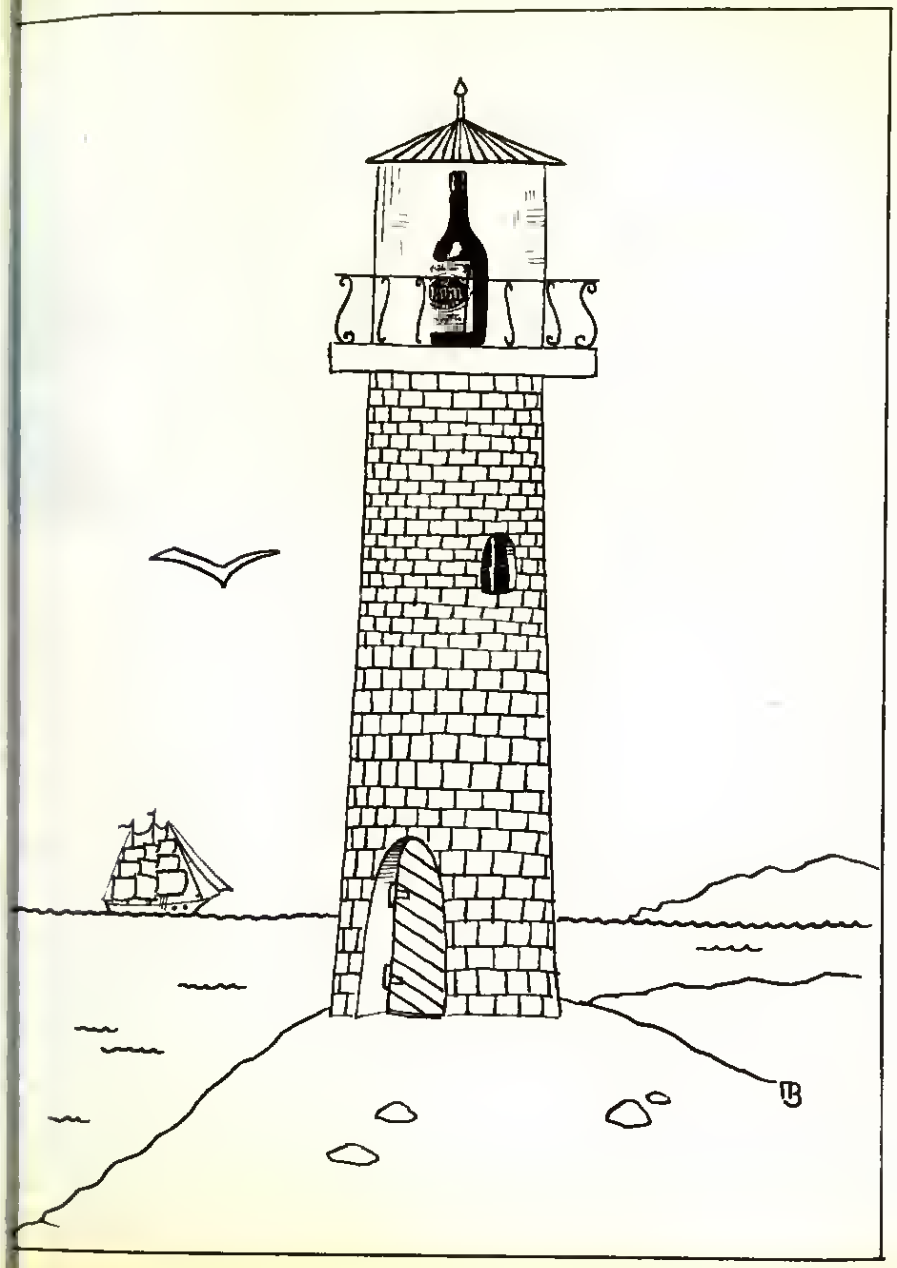
★ ★ ★

As I have already said, the elaborate burial of a priestess bears witness to social stratification in Altyn-depe, the ruined temple to the exclusive position enjoyed by the priestly class; the high level of crafts points to a well-developed trade. All this, and the traces of a written language, would be unthinkable in a primitive clan society.

Most probably these things could only date to a time when a nobility and priestly élite had become distinguishable, after settlements had developed into fair-sized cities.

Such cities flourished 5,000 years ago, side by side with nomad tribes.

Archaeology seems to be on the threshold of a major event—the uncovering on Soviet territory of one of the most ancient civilizations in the world.



HUSHING THE GUSHER

by Ruslan LYNYOV

condensed from the youth daily KOMSOMOLSKAYA PRAVDA

Through the vent of a borehole, oil blasted its way to the surface and crumpled and smashed the oil rig. Roaring black and red flames reached for the clouds. The calamity could only be compared to an erupting volcano.

Miles away across the North-West Siberian taiga, the endless virgin forest, the pillar of flame was visible. Tbe airwaves began to crackle with radio messages, and shortly one helicopter after anotber appeared and circled like wary birds over the scene. From the nearby oil town of Neftyugansk, the latest jet fire-figbting "air-gun" was dispatched with all speed.

And from the regional centre of Tyumen, 3,000 miles south, a dedicated group of men belonging to an unusual and highly specialised profession were already in the air. Nikolai Grigoriev's team are all specialists in putting out blazing gushers of oil and gas.

Grigoriev did not waste time staring at the blaze. More precisely, he did not take a single unnecessary glance at the raging inferno. He had a quick conference with the borehole workers and with the emergency fire service chief, Nikolai Kryuchkov, and then got down to business.

Tbe "gun" from Neftyugansk looked something like a giant old-fashioned mortar. Mounted on a tank, it lurched towards the flame and directed its muzzle at the gusher.

The roar of the turbines was lost in the roar of the flames. Then a powerful jet shot from the muzzle of the "gun". It shifted right, then left and strained—almost visibly. The flaming pillar moved aside a bit, clearing a path to the vent.

Now came man's turn to step into tbat hell. Under the protective cover of the jet of air, solid as an iron bar several feet above the ground, someone had to reach the vent of the borehole and fix gusher fittings on it. That operation, a real test of endurance, could only be performed in stages.

Grigoriev was the first to put on his gas mask and tank helmet, fitted with earphones and a microphone, and start off towards the heat and thunderous roar.

Tbe fire service chief looked at Nikolai's crouching figure and nervously marked time like an elephant in a zoo.

Fighting gushers with the aid of protective jets of air had already been done at the oil centre of Baku. But those had been gas gushers —fighting an oil gusher by this method was an entirely new experience. At the Neftyugansk testing ground Kryuchkov himself had put out oil fires under cover of jets. But what practice session could compare with this, the real thing?

"All O.K.!" Grigoriev's voice boomed over the radio. He had reached the vent and, after examining it, turned back. As far as his team was concerned, what their chief had done was the most important thing—he had paved the way for them.

Stepping into hellfire is easier if you know somebody has already returned from there safe and sound.

★ ★ ★

Harnessing the borehole took 10 days; not long, considering all factors. A correspondent of the youth daily newspaper *Komsomolskaya Pravda* interviewed Grigoriev, in brief snatches over several days. Below is the gist of their conversations.

GRIGORIEV: I loathe unnecessary risks. Let's say I've taken you into the team and told you to do

certain things; to hang on to me by a rope, for example. I expect you to do exactly as you're told.

Conversation is only possible before you start out. Once you're on the job the roar of the flames is deafening, and if oil gets on your goggles you're blind as well.

In such a situation every man has to do exactly what he's expected to. If you depart from the agreed procedure one iota; take any action, however correct, on your own, I'll get rid of you immediately.

CORRESPONDENT: How do you man your team? Do you take on young people?

GRIGORIEV: No, I don't. Not because I don't believe that they can be brave and disciplined. On the contrary. On one occasion, I remember, we were short of people and some Young Communist League members, students at a vocational school, were sent in to help us. Frankly, they did the job as if they were old-timers.

But there is something that neither bravery nor discipline can make up for—experience and awareness of all the finer points of the job; something that only years of work can give.

All five of us in the team are heads of families and well-balanced men. I know each one as well as I know myself. I have no right to make a mistake when choosing a man.

CORRESPONDENT: But even a well-balanced person can get scared in some circumstances, can't he?

GRIGORIEV: Well, if that happened I would simply place the man where the danger was less great. But so far the situation has never arisen with the members of the team.

It has happened with volunteers whom we select when we arrive at the scene of an accident. I always do my best to make a careful choice from among the volunteers. Haste may prove fatal.

First, I warn them of the hazards of the job. Next, the group approaches the blaze. The heat is unbearable, even though you are sprayed with a steady stream of water. At this stage some volunteers opt out.

Incidentally, at the very vortex of the fire the heat is carried upwards so it is not so hot there. But only a man of strong character can reach the centre. Once he has made his way there he will be able to do it again and again.

CORRESPONDENT: How do you measure the work you do? By the number of gushers you have put out?

GRIGORIEV: Not exactly: rather by the number of gushers I have helped to prevent, by demanding observance of all safety regulations by geologists and operators. In this our group are merciless—we have a right to be.

From experience I can say that these gushers are the result of negligence. Each is a calamity, and takes away part of the wealth of our nation. Besides, when there is less oil or gas left in the layer, there is less pressure, and it is harder to get the remainder out.

The amount of gas that daily burned out at Tarko-Sale recently

for example, could have heated three cities the size of Leningrad. The 650-foot pillar of flame gushed above the taiga for 200 days on end. Flocks of birds flew straight into the flames. That is what people sometimes do to nature. . . .

★ ★ ★

Nikolai Grigoriev came to Siberia having a long service record to his credit. His fellow oilmen called him "Master", and had good reason for that.

When a gusher got out of control at Beriozovskoye, one of Siberia's earliest oilfields, Grigoriev at first laid the blame on the inexperience of the Siberian boremen. But soon after another gusher exploded, and this time it was on the site where he was working.

The calamity struck at night. The gusher was a mixture of gas and water. The temperature stood at 40° below zero Fabrenheit. The water from the gusher spouted high into the cold air and immediately turned into snow, covering the oilmen who had been alerted in the dead of night. Under the people's very eyes the rig turned into a pyramid of ice, and hummocks blocked the way to the vent.

That was when Grigoriev launched his first independent assault on the rampaging gusher. His team went into action armed with crowbars and axes. None of them had any previous experience in handling situations like this.

Before long the ice made their working uniforms look like diving suits, but they determinedly went on with the attack. Even so, it took several days before they could finally overcome the mountain of ice around it and pull down the rig with steel cables attached to a tractor. Grigoriev himself fixed an emergency flange and gusher fittings.

It was hard to believe that they had conquered the trouble so quickly. But when the truth sank home, an emergency gusher-fighting group was set up with Grigoriev at the head.

As you listen to Grigoriev you get the impression that to him curbing gushers is neither a sport nor a chase after excitement. I would say it is pain. He does not think of Siberia as a "land of romance," in the sense many young people understand it.

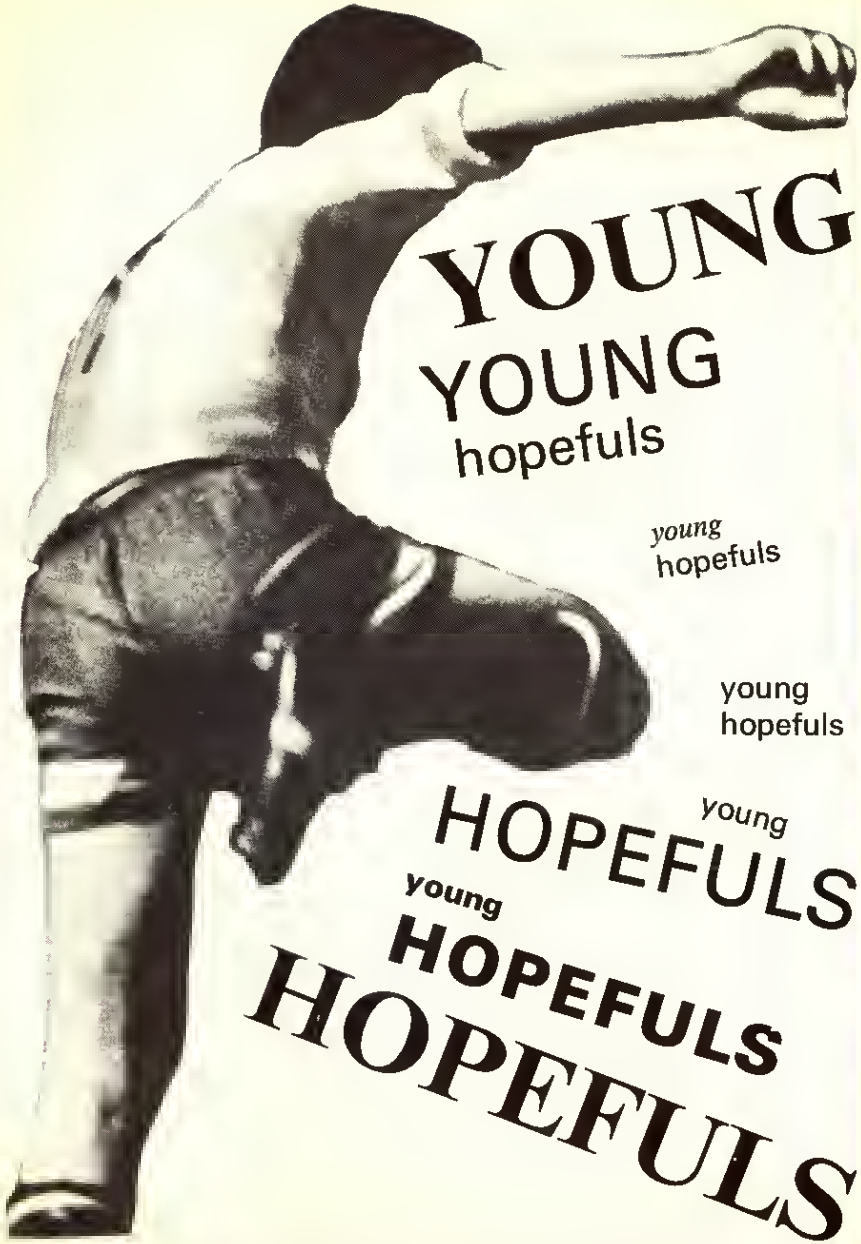
What is it, then, that attracts Grigoriev, an expert oil prospector, to a land where life is far from settled, let alone comfortable?

"Frankly, I'm not altogether clear why myself," said Grigoriev. "But there are many people like me. Each year so many volunteer to work with our expeditions!

"And another thing. I live in Tyumen with my family in a comfortable home. There is everything a person can possibly desire: theatres, cinemas, restaurants, and plenty of time to enjoy all that.

"But after two weeks or so I suddenly feel the urge to return to the North. I know it means staying in the backwoods, enduring cold, mosquitoes, bogs—my only luxury is dry sleeping quarters, because I am mostly travelling around by train.

"I know it all but I can't help myself, and back to the North I go."

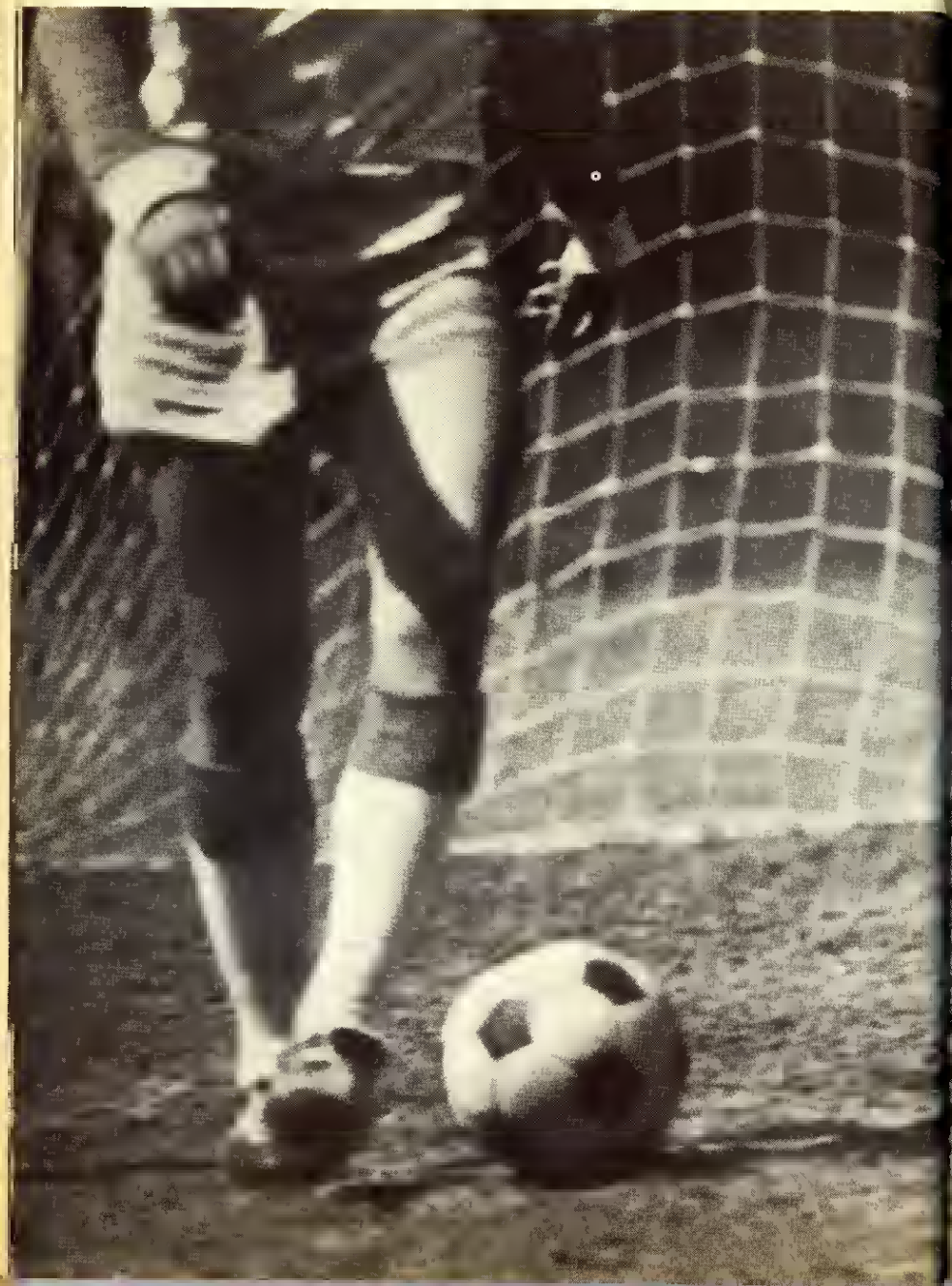


Every year thousands of junior teams in the Soviet Union take part in the tournament for the traditional "Leather Ball" trophy. The top two teams appear in the final at Luzhniki Stadium in Moscow before a crowd of 100,000, and the winners get the trophy at the hands of one of the country's leading footballers. Below: Lev Yashin congratulates the Chaika team from Minsk, capital of the Byelorussian Republic.

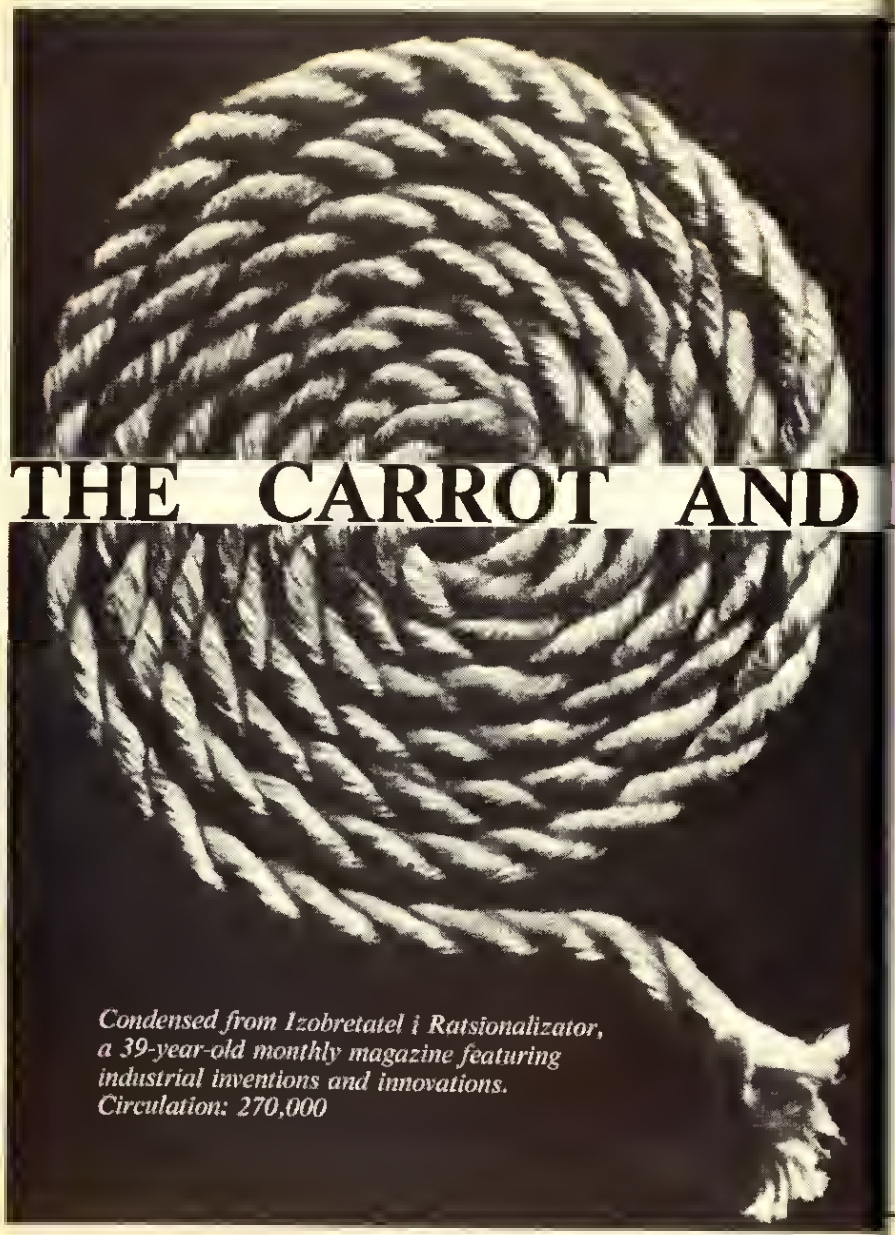
The letter "D" on a white football shirt, as worn by the young player on the right, is the emblem of one of the most famous sports societies in the country: Dynamo. It is just one of hundreds in which youngsters may take part in all kinds of sport for a monthly subscription of 25 kopecks (the price of a not very expensive packet of cigarettes).

All the drama is not on the pitch. While one young fan (below) is content to gaze and dream, another (on the left) decides to join the match. But only until Dad takes a firm hand—presumably not realising that he's dealing with a future star forward!

Right: The ball went which way? Thataway!



GOAL!



THE CARROT AND THE CABLE

by Alexander ERIN

Condensed from Izobretatel i Ratsionalizator, a 39-year-old monthly magazine featuring industrial inventions and innovations. Circulation: 270,000

'When Adam and Eve ate the apple from the Tree of Knowledge, they are supposed to have started something world-shattering. Another apple, falling at Isaac Newton's feet, gave him a flash of inspiration which led to his famous theory.

In our own day, Konstantin Dubovin enjoyed a similar moment of enlightenment while he was slicing a carrot. Dubovin's field of invention concerns steel wire cable.

This product was manufactured initially in Germany 140 years ago. The first effort was clumsy, a cable woven of twelve 0.131 inch wires.

A late nineteenth-century encyclopaedia limited itself to a description of hemp ropes, but by tbe beginning of the twentieth century the steel cable industry had boomed, and a 1913 edition described cables of 300 wire strands 1.575 inches thick and mentioned a cable intended for a bridge in New York whicb was 10 times as thick.

Four decades later the encyclopaedia discussed masterpieces nearly 5ft. thick, made of 17,500 wires, each 0.3 millimetres in diameter, with a tensile strength of 96,000 tons.

Fifteen years ago Konstantin Dubovin invented a round-strand cable that did not unreel. This invention removed the danger to a man underneath: ordinary cables sometimes slipped and sent their loads hurtling down.

After his invention, the speed of mine-tunnelling trebled. Nevertheless, Dubovin's steel cable still had the same failing as others: there was no guarantee that the load was evenly distributed over all the steel strands.

Dubovin devoted his attention to the solution of this problem, but not until that day in the kitchen with the carrots was his quest rewarded. He looked at the concentric circles of the carrot, growing smaller in diameter and width towards the core, and this gave him an idea.

That idea led to the invention of a locked spiral cable, with the spirals diminishing in size the closer they got to the centre. This ensured an even weight distribution over each wire strand.

The cable was stronger and more economical than other cables of the same diameter, and its "life" was six or seven times longer than tbat of the best cables designed previously. This cable is used extensively in hoisting systems.

The method used in the designing of the new cable opens up the way to create ideal cables for any kind of operation. At present Dubovin is working on a theory of the design of steel cables based on his discovery.

THE BOY WHO YAWNED

by Yuri YAKOVLEV

from IZVESTIA

He would yawn infuriatingly during lessons. He would screw up his eyes, wrinkle his nose and open great gaping jaws. After that he would shake his head vigorously to drive away sleep, and gaze intently at the blackboard. In a few minutes he would yawn again.

"Why do you keep yawning?" Zbenecbka asked, convinced it was from boredom. There was no point in continuing her questioning, for he was one of those silent souls.

One day he brought a bunch of slender twigs into the classroom and put them in a jar of water. Everyone laughed at his twigs and somebody even tried to sweep tbe floor with them as if they were a birch broom.

He took tbem away and put them back in water. Every day he changed it.

Zhenechka laughed at him, too.

But one day the birch broom flowered. Tbe twigs were covered with little mauve flowers like violets. Bright green spoon-shaped leaves burst from the swelling buds. Yet outside the last crystals of the slowly melting snow were still glistening.

They all crowded by the window-sill to have a look. They tried to catch the delicate sweetisb fragrance. They sniffed noisily, and kept asking what this flower was, and why was it blossoming now?

"It's called marsh tea," he murmured, and turned away.

People tend to be suspicious of their untalkative fellows. Nobody

knows what is going on in their heads—whether they are thinking good things or bad. The tendency is to assume that it must be bad. Teachers do not like these quiet types either, for although they sit quietly in class, when they are at the blackboard every word has to be laboriously dragged out of them.

To her face they called Zhenechka, who was their teacher, Yevgenia Ivanovna, the respectful form of her name. She was a thin little thing, with a slight cast in her eye. She wore her hair in a pony tail, her collar put one in mind of a horse's yoke, and her shoes had horseshoe tips on the heels. She would dash across the road, horseshoes tapping and pony-tail flying in the breeze. Whoa, horse! But she would go on running. . . . The clack of her horseshoes would gradually die away.

Zhenechka noticed that every time the bell went at the end of the last lesson the quiet boy rushed from his seat and tore out of the classroom. He would clatter down the staircase, grab his coat and disappear through the door, fumbling for his sleeves as he ran. Where was he off to?

He had been seen in the street with a fiery-red dog, which had long silky hair waving like tongues of flame. But after a while someone met him with a quite different dog, the muscles of a pugilist rippling beneath its short tawny coat.

Another time he had a black firebrand on a lead, a dog with short, handy legs. The firebrand was not charred black all over—there were brown scorch marks around his eyes and on his chest.

The children said all kinds of things about the boy Kostya.

"He's got an Irish setter," some said emphatically. "He goes duck shooting."

"Idiot! He's got a real genuine boxer. They go hunting wild bulls with those. Got a deadly grip!" others asserted.

Still others snorted contemptuously: "Huh, you can't tell a dachshund from a boxer!"

But there were others who said they were all wrong. "He's got three dogs!"

In fact he had no dogs at all.

What about the setter? And the boxer? And the dachshund?

Not even Kostya's parents knew about the dogs or what they had to do with Kostya. They had no dog at home. When his parents came back from work they would find him sitting at the desk, writing, or reciting verbs. He would sit like that till late in the evening. How could he have anything to do with setters, boxers or dachshunds?

Kostya used to get home a quarter of an hour before his mother and father, and barely had time to brush the dogs' hair from his trousers.

Apart from those three dogs, there was a fourth. A huge dog with a great head, of the kind that goes to the aid of people trapped on mountainsides by avalanches. Bony shoulderblades protruded from beneath his long shaggy fur, great sunken eyes looked out mournfully upon the world, and his heavy leonine paws, which could have felled any other dog with a blow, moved slowly, wearily.

Nobody had ever seen Kostya with that dog.

The bell at the end of the last lesson was like a signal rocket, summoning Kostya to that mysterious life which was a closed book to all the others. However carefully Zhenechka watched, as soon as she took her eyes off the boy for a moment Kostya disappeared, vanishing into thin air.

One day she could contain her curiosity no longer, and set off in pursuit. She flew from the classroom, horseshoe tips clacking on the stairs, and she caught sight of him just as he was dashing towards the door. She leapt after him out into the street.

Kostya ran home—he lived in a green-painted, dilapidated house. After five minutes or so he reappeared.

Zhenechka waited behind a bit of projecting wall. He tore past; she hurried after him. Not a single passer-by would have imagined that this slightly squinting girl rushing through the puddles was Yevgenia Ivanovna, schoolteacher.

Kostya dived into a winding back turning and disappeared into someone's front entrance. She heard him ring the bell. Immediately there was a strange subdued howling, and some energetic scratching against the door. Then the howling gave way to impatient barking, and the scratching to an insistent drumming.

"Quiet, Artyusha, wait a minute!" Kostya called out.

The door opened, and a fiery-red dog leapt out at Kostya. He planted his front paws on the boy's shoulders and started licking him on the eyes, nose and chin with a long pink tongue.

"Stop it, Artyusha!"

Not on your life! Zhenechka heard more barking and a clatter on the steps, and both boy and dog shot down with incredible speed. They almost knocked Zhenechka off her feet, but she managed to press herself flat against the railings in the nick of time.

Neither paid the slightest attention to her. Artyusha dashed around the courtyard in circles, frisking about and kicking his hind legs in the air like a kid. And all the while he kept barking and trying to jump up to lick Kostya on the cheek or nose. They chased each other for quite a time, and then reluctantly returned to the house.

They were met by a thin man with a crutch, and the dog rubbed against his one leg.

"There, we've had our walk. See you tomorrow," Kostya said.

"Thank you."

Artyusha vanished, and it was as though someone had put out a fire on the steps.

Now they had to hurry along the street to the third turning. They arrived at a two-storey block of flats in the depths of a courtyard. A boxer stood on a balcony, his front paws on the railings. He had prominent cheekbones and a short, flattened nose. His eyes were fixed on the entrance to the courtyard. When he saw Kostya they lit up with joy.

"Atilla!" Kostya shouted, running in the direction of the balcony. "Atilla!"

The boxer let out a yelp. From sheer happiness.

Kostya ran to a shed, got out a ladder and dragged it to a spot below the balcony. It was a heavy ladder, and it was all the boy could do to lift it, so that Zbenechka found it hard not to rush to his aid. When Kostya had it in position against the balcony railings the boxer came down it, and she noticed that one paw was lame.

Kostya got out some provisions from a newspaper package. The dog was famished. He ate greedily, looking at Kostya from time to time as though he were about to speak.

When Atilla had finished his dinner, Kostya patted him on the back and put him on a lead. The drooping corners of the dog's great black-lipped mouth trembled at each springy step, and every now and again the animal would hold his injured paw off the ground.

Zhenechka heard the caretaker exclaiming to herself as the boy and the dog left the courtyard, "They leave the dog on the balcony and go off somewhere. He could have starved to deatb. Some people!"

When Kostya left, Atilla looked after him with devoted eyes. The dog's face was marked by dark wrinkles and a deep fold ran across his forehead. His stumpy tail twitched silently.

Zhenechka felt she would like to stay with that dog. But Kostya was hurrying on.

In the next block a sick youngster lived on tbe ground floor. He had a dachshund—the walking firebrand. Zhenechka stood beneath the window listening to Kostya and the sick boy talking.

"He's waiting for you," the dog's owner said.

"You're ill, don't worry about him," Kostya replied.

"I'm ill . . . I won't worry about him," the boy agreed. "Perhaps I'll give you my bicycle if I can't ride it?"

"I don't want your bike."

"My mother wants to give my dog away. There's nobody to take him out in the morning."

"I'll come in the mornings," Kostya said after a moment or so of thought. "Only it'll be very early, before school."

"Won't you get into trouble at home?"

"No. I'll get by, I'll manage to scrape through. It's just that I'm so sleepy, I do my homework so late."

"If I ever get up again, we'll go out for walks together."

"You'll get up all right."

"Do you smoke?" asked the sick boy.

"I'm a non-smoker," Kostya replied.

"So am I."

"Well, we're off. You just relax. Come on, Lapot!"

Kostya came out with Lapot, the dachshund, under his arm. Before long they were both walking along the street.

Zhenecbka followed. She wanted to speak to Kostya, to ask him about the dogs he fed and took for walks,

whose faith in man he was doing his best to preserve. But she walked on in silence after the schoolboy who yawned so revoltingly in class and had a reputation for being uncommunicative. Now be had undergone a change in her eyes, like the bare twigs he had brought into the classroom.

Lapot finished his walk and was taken back home. Kostya tore on still further, and Zhenechka continued to dodge behind the backs of passers-by. The buildings were not so tall now, and the passers-by not nearly so frequent as they had been.

Tbey came to the end of the town, to where the sand dunes began. Zhenechka's high heels made it difficult to walk on the shifting sand, over gnarled pine roots, and in the end one of her heels came off.

Now they were right by the sea.

It was smooth and calm. The waves did not hurl themselves upon the low shore, but quietly and unhurriedly crawled over the sand and just as slowly and noiselessly withdrew, leaving a white edging of foam behind. The sea had a lazy, sleepy look.

Kostya walked along the beacb, head bent forward against the wind. Zhenechka took off her shoes—it was easier to go barefoot, althougb the cold, damp sand stung the soles of her feet. Fishermen's nets with round bottle-glass floats were hanging on stakes to dry along the shore, and here and there were upturned boats.

A surprisingly long way off, at the very edge of the water, she could make out a dog. He stood motionless, in a strangely rigid pose. He had a great head, protruding shoulder-blades and a dejected tail. His eyes were fixed on the sea. He was waiting for someone.

Kostya went up to tbe dog, who did not even turn his head. It was as if he did not hear Kostya approaching. The boy ran his hand through the shaggy fur, and the dog's tail moved almost imperceptibly.

Kostya squatted down and took from his newspaper parcel some bread and the remains of his own lunch, placing tbem before the dog. There was no response, and Kostya began stroking him and talking in cajoling tones: "Come on, now, eat it up . . . come on, boy, just a little."

The dog looked at him from his huge sunken eyes and then resumed his vigil.

Zhenechka hid behind some nets, although she would have liked to stroke the dog, too, and to have had a go at persuading it to eat.

Kostya picked up a piece of bread and held it to the dog's mouth. The dog sighed—gustily, like a buman being—and began to chew it slowly. He ate without interest, as though be was full or used to better things than bread, cold porridge and a piece of gristly meat out of the soup. He just ate to keep alive. He had to stay alive—he was waiting for someone to come from tbe sea.

When everything was eaten, Kostya said, "Come along. Let's have a walk."

The dog looked at the boy again and obediently walked by his side.

He had heavy paws and a deliberate, dignified, almost leonine gait. His paw-marks filled with water.

The boy and the dog walked leisurely along the shore, and Zhenechka the sleuth heard Kostya tell the dog, "You're a good dog. You're faithful to your master. But you come with me. He'll never come back. He's dead. Word of honour."

The dog was silent. He still did not take his eyes off the sea. Kostya could not convince him. He was waiting.

"What am I going to do with you?" the boy asked. "You can't live by yourself on the seashore. You've got to go somewhere."

They came to the end of the fishermen's nets. Kostya turned round and saw his teacher. She stood barefoot on the sand, her shoes tucked under her arm. The sea breeze ruffled her pony tail.

"What are you going to do with the dog," she asked, worried.

"He won't go away," the boy replied. He did not seem in the least surprised to see her. "He'll never believe that his master's dead."

Zhenechka went over to the dog. The dog growled softly, but he did not bark or go for her.

"I've made him a house out of an old boat. I bring him food. He's so scraggy. To begin with, he bit me."

"He bit you?"

"On the hand. Now it's quite better. I put iodine on it."

After they had gone a few yards, he said, "Dogs always wait. Even for the dead. . . . You have to help them."

The surface of the sea grew dull and seemed to contract a little. The darkened sky pressed down on the sleepy waves. Kostya and Zhenechka saw the dog back to his post, where a boat lay upside down right by the sea, propped up on a block of wood to give the dog room to get underneath. The dog sat down on the sand and froze into his eternal attitude of expectation.

★ ★ ★

At the end of the last lesson next day, Kostya dozed off. He yawned and yawned, his head fell on to his arms and he went right off to sleep. At first nobody noticed. Then someone giggled.

Zhenechka saw what had happened.

"Be quiet," she said. "Absolutely quiet."

When she set her mind to it, she could make them do just what she wanted. They could be as quiet as mice.

"You know why he's fallen asleep?" she asked in a whisper. "I'll tell you."

The bell rang to signal the end of the last lesson. It rang loud and long. But Kostya did not hear. He was fast asleep.

Yevgenia Ivanovna—Zhenechka—leant over the sleeping boy, put her hand on his shoulder and shook him gently. He started, and opened his eyes.

"The bell's gone," Zhenechka said. "Time for you to go."

Kostya jumped. He grabbed his satchel. And the next minute he was streaking through the door.

from the magazine ZNANIE—SILA

DON'T BE DOWNHEARTED, POLYGLOT!

by Valentin FINEBERG

Even if all the best and most useful books in the world were translated, we would still need to learn foreign languages.

How urgent the need is can be seen from the fact that the USSR, which leads the world in this field, translates only 1.5 per cent of all the books published in the world.

Leaving aside technical and scientific translations which become available some five or six years later, good translations of literature may come out only a long time after the original publication. A valid Russian translation of Dante's *Divine Comedy,* for instance, became available only 650 years after it first appeared; Rabelais' *Gargantua and Pantagruel* 400 years later; Shakespeare's plays 300 years later, and so on.

Russian readers—and others, no doubt—have yet to see many masterpieces of world literature translated into their own language.

It is estimated that there are 2,796 languages in the world, quite apart from dead ones like Latin, Greek, Hittite, and Aramaic. Voltaire summed it up when he said that the distinction of language was one of the greatest misfortunes of existence.

Which of these 2,795 foreign languages should we learn? Is it worth learning just one, when all the others will still escape you?

There is no cause to be downhearted, however, for there are 13 "major" languages, each of which is spoken by more than 50 million people. Consider the following table:—

Chinese is spoken by	**700 million**
Hindi (and Urdu)	**280 „**
English	**250 „**
Spanish	**150 „**
Russian	**130 „**

German	100 million
Japanese	100 „
French	80 „
Indonesian	80 „
Portuguese	80 „
Arabic	70 „
Bengali	60 „
Italian	60 „

So to talk with two-thirds of the world's population you need to know only 13 languages. They are the official languages in about 65 countries. They are the languages of science, art, diplomacy and commerce. But I hasten to ease the minds of those who may object to the number 13; a smaller number will do.

Which language is the most important? On the previous score it would appear to be Chinese, which is spoken by one person in four on the globe, and then Hindi, etc. But that would be a hasty conclusion, because the usefulness of a language is determined by many factors, and the number of those who speak it is only one.

There is the volume of writing in the language, and the information it carries. It is mainly by reading that we learn of the scientific and technical achievements of other countries, their art and literature, their political and social developments.

What is the standing of the languages in this particular table? Here are the number of newspapers published and the number of copies printed in various languages:—

	Number of newspapers (titles)
English	2,430
Spanish	1,000
German	670
Chinese	550
Languages of India	500
French	270
Portuguese	260
Russian	250
Japanese	160
Dutch	140
Italian	130
	No. of copies (millions)
English	98
Japanese	36
Russian	30
German	20
French	14
Spanish	11
Chinese	7.3
Italian	5.7
Dutch	4.5
Portuguese	3.5
Languages of India	3.5

We find that almost as many newspapers are published in English as in all the other languages taken together. German, French and Spanish, our old school acquaintances, are well up in the newspaper league. Japanese has a high standing, but Chinese and the languages of the Indian subcontinent rank seventh and eleventh in number of readers.

The table on the next page shows the number of books published throughout the world (no data is available on Chinese).

	Titles
Russian	58,100
English	42,000
German	33,500
Japanese	25,000
French	16,000
Spanish	15,000
Italian	13,000
Portuguese	8,000
Swedish	6,000
Rumanian	5,600
Others	30,670

The greatest number of books is published in Russian, with English a strong second, and German and Japanese runners-up.

Now consider the number of technical books (again no data available on Chinese):—

Russian	28,000
English	9,200
German	6,200
Japanese	4,000
Italian	2,300
French	2,200
Spanish	1,800

Some readers may find these figures quite unexpected: for example, the number of scientific and technical books in Russian, which is greater than the total appearing in all the other major languages taken together.

It seems that a Soviet engineer, for example, has most need of English of all the foreign languages, then German and then, apparently, Japanese. The rapid development of Japanese science and technology, and the fact that there are very few translations available, make the study of that language particularly useful.

The world demand for a language is an indication of its "usefulness", and demand is gauged by the number of translations made from it into other languages. Altogether, some 30,000 translated books are published throughout the world every year, of these, 33 per cent are from the English, 15 per cent from the Russian (including translations into the Soviet languages), 13 per cent from the French, and 10 per cent from the German.

Finally, geographical distribution is an important factor in the choice of a language to learn. Take Spanish: it was spread to 20 countries by the caravels of Columbus and the swords of the conquistadors. English is an official language, or is widely spoken, in 15 countries, Arabic in 13, French in nine and German in three.

Consequently, you could travel in 60 countries without an interpreter if you learned only five languages, which is not quite so formidable a task as learning 2,795 or even 13.

No wonder, then, that these five have been selected for study in higher schools. In these five languages you can talk with 30 per cent of the world's population, and read 80 per cent of all books, newspapers and magazines. But the area covered by each of them is much larger still, because each is to some extent an international idiom.

Anyone can learn five languages. Don't forget this is easier now with the development of audio-visual aids.

MAN FIGHTS COLD

by Vitali MOYEV

from the magazine SMENA

On Saturday, March 16, a telegram arrived from Tula, 100 miles from Moscow: THREE DAY BLIZZARD STOP CARS LORRIES SNOWBOUND ON LIPETSK YEFREMOV TULA HIGHWAY STOP AWAITING SNOWPLOUGHS.

Winter did not want to give in. Despite heavy storms in previous months, it had not yet exhausted its stock of snow. In almost no time white snowdrifts blocked the roads linking these Central Russian towns.

Forty-ton tip-up lorries roared like trapped mammoths, inter-town buses snorted angrily, but all in vain. The snow was invincible. Drivers attempts to wrest their vehicles from white captivity were useless.

However, nobody gave way to panic. Local collective farmers came in sleighs to take women passengers with children to their villages, warmed and fed them and put them up for the night. Drivers who stayed with their vehicles were brought hot food. Dozens of tractors and bulldozers headed for the highway. Sappers from military units stationed nearby came to the rescue.

On the Monday morning the blizzard began to subside. Soon another cable arrived from Tula reporting that the last 700 vehicles had resumed their journeys.

The cost of winter

IN heavy snowfalls, 120 cleaning and loading machines and 1,000 tip-up lorries remove snow from more than 16 million square yards of Moscow's streets. (In ordinary weather 500 tip-up lorries work round the clock.)

Some 150 special trucks move about the streets and squares, scattering sand over the roadway. Then street-cleaners come out and sweep the dirty mixture of sand and snow into the gutter. Moscow needs 6,475,000 cubic feet of sand for the winter season: 90,000 trips by tip-up lorries are necessary to deliver it.

To remove the snow cleared in Moscow during winter a 1,700-mile-long train would be required.

In the winter of 1966 snow had to be cleared from 55,550 miles of railway track and thousands of miles of motor roads. Tbis cost 43 million roubles. Millions are spent annually on the struggle against snow in cities and towns and on technical research for this purpose.

In winter, bricklaying is 30 per cent dearer and concrete work costs 10 per cent more. Winter immobilises river and sea-going vessels and more expensive means of transport have to be used.

This country uses annually 50 million tons of fuel to heat homes, industrial and office buildings. In winter, gas consumption in Moscow is twice as high as in other seasons.

The figures in the next column show the annual expenses of Soviet people on individual protection from cold, in millions of roubles.

Furs and fur items	**428**
winter hats	**294**
felt boots	**284**
heavy woollen overcoats	**3,493**
heavy woollen suits	**1,204**

The total cost of all these anti-freeze measures: 5,703 million roubles.

It is difficult to grasp the financial burden imposed on us by winter.

"Twelve thousand ten-storey buildings, a big modern city with a five-million population . . . the money that could have been spent on building such a city will go to fight cold." This is how Yeremei Parnov and Mikhail Yemtsev, Soviet popular science writers, describe the state of affairs. But their estimate, far from being exaggerated, is understated.

Façade on the Arctic Ocean

Once I spent a fortnight at an explorers' base on Cape Schmidt. Every day I trudged to the extremity of the Cape and gazed at the white expanse before me, broken only hy a few wooden crosses dotted here and there.

Cold, biting wind blew from the ocean over the frozen, snow-covered land stretching for thousands of miles. It was here, at the tip of Cape Schmidt, that I fully realised the meaning of the words of Admiral Makarov, the famous Russian Polar explorer, who compared Russia to a great edifice facing the Arctic Ocean.

The country's façade, fronting the Arctic, stretches for about 4,500 miles (almost half the Arctic Circle) from the Norwegian border to the Bering Strait. There is not a single mountain range protecting the land from cold. But there are many high mountain chains in the south: the Hindu-Kush, the Pamirs, the Altai, the Sayans, which serve as a barrier trapping the cold masses of Arctic air and making them swirl over vast areas of the Soviet Union.

This is one of the reasons why the Polar zone in the USSR stretches so far south from the Arctic Circle. The permafrost zone—where the ground is permanently frozen to a depth of several yards—occupies almost balf the country's territory, ahout four million square miles.

Back in the early years of the first five-year plans, systematic exploration and prospecting work was started in these areas with a view to building large industrial centres and ports, such as Kirovsk, Berezniki, Novokuznetsk and Igarka.

Soviet explorers have organised some 500 expeditions in the Arctic: 15 drifting Polar stations have carried out research in the Arctic basin, and over 100 stations have been set up on the shore and islands of the Arctic Ocean. Last year the icebreaker *Novovoronezh* opened up the Arctic Sea Route, connecting the western and eastern extremities of the USSR for ships of all nations.

I vividly remember my first visit to Norilsk, the biggest iron and steel centre within the Arctic Circle. The interior of the bus we boarded at the airport was covered with hoar-frost and the windows were frozen. I could not see any of the town, and was anxious to get to a hotel as quickly as possible.

The temperature was 22 degrees below zero Fahrenheit and there was a sharp wind, so I lost no time getting through the three successive doors into the vestibule. There, after catching my breath, I was surprised to see fresh, lush greenery along the walls and in the lobby.

Even after having spent some time in the town, I couldn't help marvelling at the fresh flowers in offices and homes built on piles driven into the permafrost.

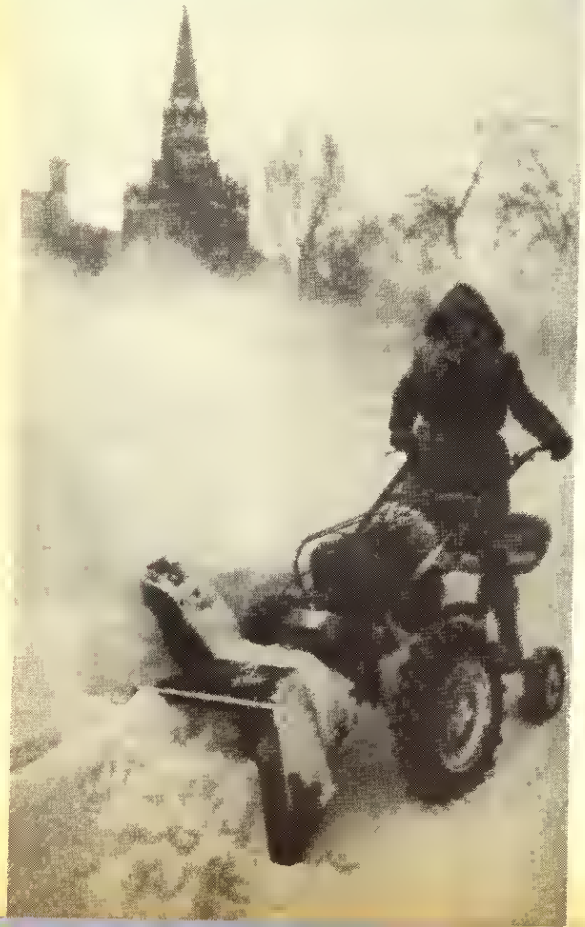
Before starting to build Norilsk, experts argued a great deal about whether it should he an ordinary town with dwelling houses, or a workers' settlement with hostels and hotels for those who would come to work under three- and five-year contracts.

Some people held the view that the ore should only be extracted here and then processed in the south, on the "mainland", as they say in the Far North.

Adherents of this view referred to the experience of some foreign industrialists and engineers, who claim that under Arctic conditions an incomplete industrial cycle, and even seasonal production, is logical. They usually cite as examples the Cassiar asbestos mines in British Columbia and the iron-ore mines in Labrador.

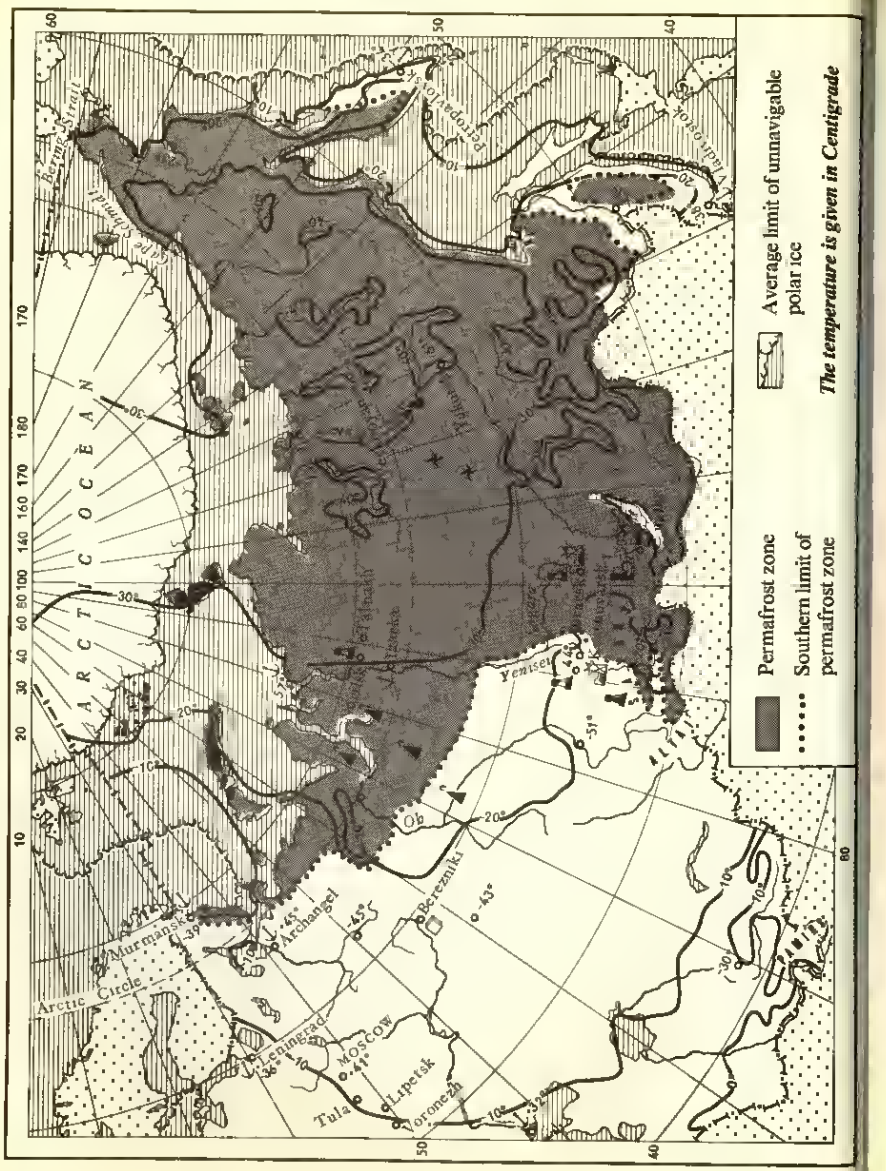
Continued on Page 59.

Three ways in which Moscow clears up after a heavy snowfall. There are mountains of the stuff to get rid of.



On opposite page: An ice-breaker deals with effects of cold in the Arctic, opening up a channel for navigation.

Bottom: They even try to clean up Siberia! Railways, at any rate, are kept clear throughout the winter.



However, the views of those who wanted Norilsk to be a full-fledged town prevailed. The town was planned by Leningrad architects, who took great pains to make it look like any ordinary town. This, of course, was only in outward appearance. The Norilsk method of housing and industrial construction received the highest state award and evoked great interest in many countries.

The Norilsk mines are now a part of an industrial complex working all the year round, despite the hazards of permafrost.

All those tons of snow have to be put somewhere. Left in the street, they could flood the city in spring. Strings of lorries cart them off.

An armada of machines

Prospecting for oil is going full blast in Siberia. In 1960, oil and gas deposits far surpassing those in other regions of the Soviet Union were discovered in Western Siberia.

By 1970, oil production in Western Siberia will reach the level of Azerbaijan's, the country's oldest oil-producing region. By 1980, it is planned to raise the oil output here to the 1966 figure for the entire country.

Despite extremely unfavourable climatic conditions in the country's north and east, vast territories are being explored, populated and put to use. Arctic regions are extremely rich in natural wealth. The Talnakh ore deposits near Norilsk, for example, have a 24 per cent content of pure metal.

Capital investments in the development of northern regions are expected to reach 70,000 million roubles by 1980. The projects already planned will require more expenditure than did the entire Soviet economy in the pre-war period (between the end of the Civil War in 1920 and the Nazi invasion of the Soviet Union in 1941).

A huge armada of machines is being dispatched to the cold regions of the North and East. The number of breakdowns and mishaps, the intensity of wear and tear on equipment in these regions are three, five and sometimes even 10 times greater than in warmer climes. Scientists and engineers are working on special designs and standards for machines and materials to be sent to the North.

Fighting against warmth?

Many books have been written about transforming the earth's climate and fighting cold.

A daring plan advanced by Soviet engineer P. M. Borisov was under discussion a few years ago. He proposed to dam the Bering Strait, which separates the easternmost tip of the USSR from Alaska, and pump the water of the Arctic seas in the direction of the Equator. Borisov claimed that this artificial change in the heat-and-cold balance would raise the temperature in the northern hemisphere so that the climate in Siberia would be akin to that of the Central Ukraine.

It was estimated that this project would cost 11,000 million roubles. In other words, it is feasible both technically and financially. But when interference with nature is concerned, it is not only money or technical feasibility that counts.

Of course, "co-existence" with cold costs money and effort. But at the same time man is making cold serve his needs. In the tundra and marsby taiga, ice roads are widely used, and dams and warehouses built of ice are extremely cheap to construct. (Blocks of ice have been made under great pressure in laboratory conditions that can stand heating to 347 degrees Fahrenheit.)

Construction of entire towns under protective cupolas is contemplated, using methods of building evolved in Norilsk.

The question arises: should we fight cold, or should we make it our ally? This question is becoming more urgent with every passing year, for the grave prospect of the world "losing cold" is getting nearer and nearer.

Here is what Dr. Nikolai Semyonov, Nobel Prize winner and Vice-President of the USSR Academy of Sciences, said on the subject:—

"Is there a limit to raising the aggregate capacity of electric power stations when thermonuclear energy becomes available?

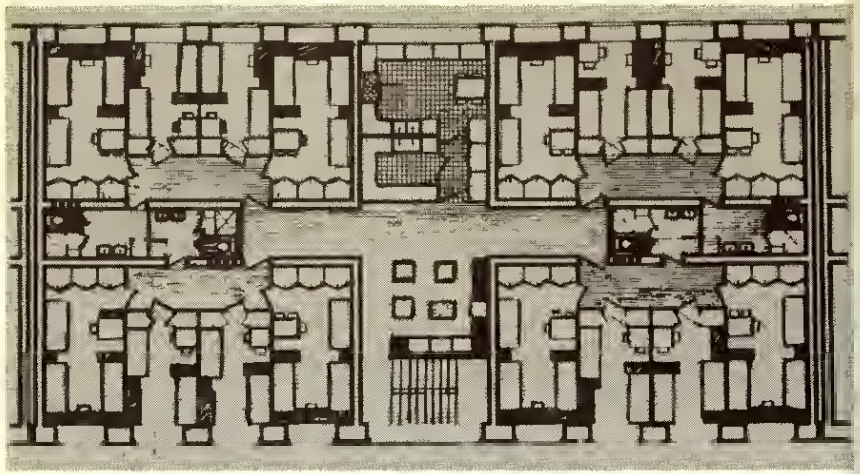
"I am of the opinion that there exists such a limit because the earth's surface and atmosphere can become overheated as a result of thermonuclear reactions.

"When the heat produced by thermonuclear reactors reaches 10 per cent of the amount of solar energy received by the Earth, the average temperature on earth may rise by some seven degrees. This could cause speedy melting of snow in the Arctic and Antarctic which, in turn, could result in a deluge and other unpleasant consequences. Therefore, production of thermonuclear energy should not exceed five per cent of solar energy . . ."

Thus a rise in temperature is regarded not as a coveted aim of painstaking research, but rather as a by-product of civilization and a brake on the expansion of power production.

So, if overheating begins to threaten this earth of ours, cold might well become man's ally, fighting in the front ranks to protect us.

About [illegible] two men is about 40 ft. [illegible] eternally frozen soil—this underground chamber is part of an institute studying [illegible] frost in Yakutia, Siberia



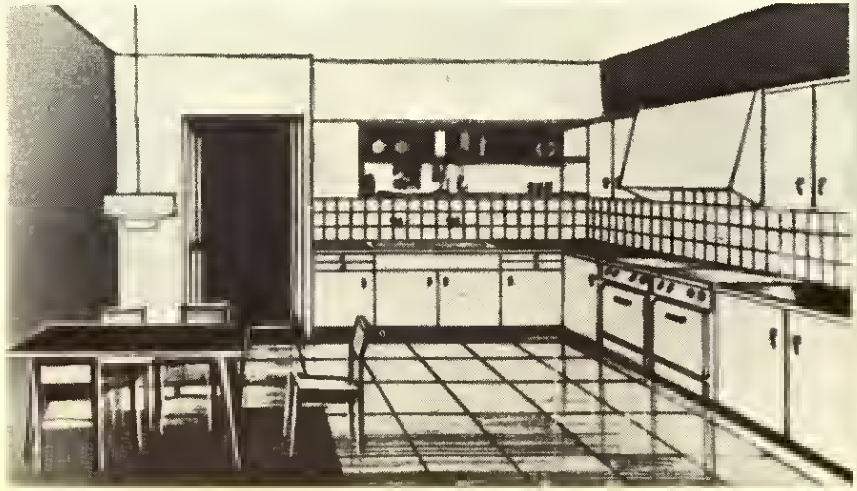
SHIVER-PROOF LIVING

from the newspaper STROITELNAYA GAZETA
(Building Workers' Newspaper)

ABOVE: Façade of a cold-proof hostel for 540 people, designed to keep out eternal frosts of at least minus 50 degrees Fahrenheit.

TOP LEFT: Floor plan of a hostel for the Far North. Rooms are heated by warmed air sent up from the ground floor.

BOTTOM LEFT: Communal kitchen in young workers' hostel, with an abundance of cupboards. Hood over gas stoves removes cooking smells.



The Researcb Institute for Standard and Experimental House-building in Leningrad has designed various-sized hostels for young workers coming to Eastern and Northern Siberia, land of eternal frost, strong winds, deep snow and very low winter temperatures. They can take 120, 260, 400 or 540 people.

The buildings are designed to withstand frosts of minus 50 and even minus 85 degrees Fahrenheit. They will stand on piles driven into the permafrost; will be 50ft. wide, considerably more than is standard for bouses in moderate zones. This is to cut down the perimeter, and so reduce loss of heat.

Air-conditioning systems installed on the ground floor will supply air to all rooms and corridors, so that windows will not have to be opened unnecessarily and let in cold air. There will be no basements, because these lead to heat losses into the ground.

The hostels will be brick structures, with as much variety in design as possible. They will also be brightly painted, an important aesthetic consideration for people living in these snowy regions.

Two persons will live in a room. There will be cafés, clubs, gyms, barber's and various repair shops on the ground floor.

THE ROUTE

by Yuri TEPLYAKOV

from the newspaper TRUD

The "Milky Way of the North", a highway whose real name is the Kolyma Route, connects the town of Magadan, in the Far North of the USSR, with the goldfields deep inland. The Route gets its nickname because of the constant stream of headlights and clusters of lights marking workers' settlements along the road.

Fifty-degree frosts, thick fogs and raging blizzards reign over the highway day and night. Lorries speed along it round the clock, transporting more than a million tons of the most varied freight annually.

Evening found me in Strelka, a settlement some 200 miles from Magadan. In the dead of night the dispatcher's office was informed by radio of a disaster on the 47th mile of the Route. An avalanche of snow had swept over several lorries . . . three people were missing.

Everyone was wide awake and anxious for further news. It was not hard to imagine the relentless lava of snow gathering strength and sweeping the heavy lorries off the road like so many toys.

Time dragged. At last the radio crackled again. Two of the three missing men had been rescued. More avalanches were reported on the 115th and 126th miles. Rescue teams and bulldozers were on the way, groping inch by inch through the blinding blizzard to the disaster points.

Suddenly the door of the dispatcher's office swung open and in strode the boys from the 47th mile. Among them was Konstantin Slobodskov, one of the rescued drivers.

To my surprise, nobody made a fuss over them. They were greeted laconically and given mugs of very strong hot tea.

The highway was a hard master, and every man there had at one time or another suffered a similar experience.

In the morning we resumed our journey. The road was clear. We passed lorries half-buried in the snow, their bodies crumpled, tyres torn to pieces. The snow was already beginning to cover the traces of bonfires and tractors.

Without slowing down, huge trailer-trucks loaded with machinery, and refrigerated trucks of fruit from Tashkent sped past us on the way to the Kolyma goldfields.

The Route is certainly the life-line of

A HAIR RAISING STORY

condensed from the weekly NEDELYA

Young Omar Chelidze contracted eczema of the scalp and had to be treated with X-rays. The boy recovered, but all his hair fell out. His playmates' teasing gave him no peace and his parents were willing to do anything to help their son.
Some time later Omar's friends were amazed to see his head covered with thick wavy hair. They examined it sceptically, suspecting a wig. But it was genuine. That is just one of the many miracles worked by a hair-restoring preparation discovered by Nina Kakheladze.
Here is the story of its discovery . . .

Visitors to the Botanical Gardens in Tbilisi always notice a beautiful delicate plant with large buds. The plant is a unique Georgian iris, to be found only in Georgia, and like certain dynasties it degenerates and gradually dies out.

Staff members of the Tbilisi Botanical Gardens were determined that the flower should not become extinct.

One of the scientists who tackled the job was Nina Kakheladze, M.Sc. (Biology), a seed expert and plant breeder.

To try to make the fragile Georgian plant sturdier, she crossed it with distant cousins, less beautiful but hardier. The result was a rare combination of hardiness and beauty.

The hybrids aroused the interest of British, Dutch and American plant-breeders. That success might have determined the botanist's line of work, if not for an accident that completely changed the direction of her research career.

The fragile petals of her irises were attacked by a parasitic fungus. The plants began to die, one after another. Chemical preparations she tried seemed powerless to halt the destructive disease.

Then Nina Kakheladze turned to the plants themselves; or, more precisely, to the specimens which were capable of secreting compounds that destroy micro-organisms.

Such plants were available in the Gardens' collection and the hybrids survived.

The Kakheladze family, together with their friends, celebrated Nina's second success. In the tradition of Georgian feasts, Nina's father proposed one toast after another in his daughter's honour. In one, he humorously compared the luxuriant growth of Georgia's vegetation, which his daughter was helping to protect, with the sad state of the thinning vegetation on top of his cranium, which unfortunately nobody was preserving from the ravages of time.

The head-garden!

Nina's father could not have guessed at the time that his hair would soon become the object of his daughter's experiments!

If substances could be found to protect irises from fungi, perhaps the same substances could also prevent human beings from going bald, she reasoned. Nina realised there was a world of difference between returning beauty to flowers and doing the same for man.

But still, why not try?

As "co-author" of the idea, her father promised to allow her to use his head as an "experimental plot", although he was aware of the risks involved: as yet no effective remedy for baldness had been found, and the search for such a remedy had quite often ended sadly for the volunteers.

But the first results surpassed all expectations. His dandruff disappeared and the hair grew strong, soft and silky.

But Nina wanted a lot more: she decided to try to restore his once-abundant hair. With that end in view, she boldly experimented with the growth agents which had helped plants to take root in unfavourable conditions.

Thus began her search for a "youth elixir", as her sceptical colleagues dubbed her work.

When the formula for the ointment was eventually evolved, it had to be tested on many different people. Her appeal for volunteers among her fellow-researchers met with disappointment.

Help came from women who believed in her method and strictly observed her rules for using the ointment. Several mothers and their children began getting favourable results. And naturally, Nina's preparation soon became the talk of the town.

Doctors and beauticians displayed an interest in the work of the Georgian scientist: it gave a new gleam of hope to their patients.

How does the new preparation work?

The skin of the human head is assailed by thousands of fungi, bacteria and viruses. These agents of disease constantly multiply the number of bald heads.

Contributory factors are sometimes the insanitary condition of the skin, malfunctioning of the central nervous system, hereditary predisposition to baldness, and many more largely uninvestigated factors.

Nina Kakheladze has no exhaustive explanation either: all she has to offer is a hypothesis, which is subject to checking.

What is known as ringworm is caused by a fungus which gets into the root of the hair and from there into the hair itself, where it multiplies, and before long the spores fill the whole hair. It bursts, spreading the spores over the neighbouring areas of the scalp, destroying the hair.

Process reversed

The new curative ointment stems and reverses the process—a dual effect. In addition to killing harmful micro-organisms, it stimulates the growth of healthy cells of the skin, which win back its fungi-bared space. The healthy cells contain germs of future hairs. They reach deep down into the tissue to develop into hair roots and finally into healthy hairs which grow on the bald patches.

Nina Kakheladze warns enthusiasts against the mass application of her ointment, and premature conclusions. "The research has yet to be completed," she says. "Accumulating more experimental data and building the appropriate theory will take at least several years."

Nevertheless, she treasures an album containing more than a hundred photos of her patients, taken before and after treatment. And when I talked to some of them, they told me that the new ointment had made their hair grow even over old scars and burns.

Furthermore, one patient, a certain Zara V. of Riga, said she had been cured of seborrhoea. Final victory over that disease which causes dandruff, acne and other distressing conditions might well be marked by the award of a Nobel Prize.

MAN AND HIS WORK

This article deals with the pros and cons of two important and related problems: the population shift from country to town, and labour fluctuation in industry.

by Victor PEREVEDENTSEV,
an economist
condensed from the magazine JOURNALIST

Migration from countryside to city is a natural process, common to all countries. Can the process be arrested? Or should it be? This has been a much-debated subject during recent years.

The majority of the Soviet urban population consists of former villagers, or children of parents from rural areas. This shift from countryside to city has been responsible for some 90 per cent of the total growth of the urban population over the past four decades. And since the 1959 census the urban population has increased by 28 million, the majority of them having moved from farms and villages.

Is this trend good or bad? Does it create a problem for the state or not?

Yes, a problem exists, and it is an acute one. For most city-bound migrants happen to come from areas where there is a shortage of agricultural labour, while in other areas, notably in non-Russian republics, there is a shortage of manpower in industry, yet rural residents stick to their farms and villages.

Take Western Siberia. In the past eight years the rural population has decreased by 10 per cent—this in an area which, it is estimated, needs 30 per cent more able-bodied agricultural workers.

On the other hand, the rural areas of Central Asia suffer no labour shortage, yet the population there has increased by 20 per cent.

Georgia has a labour force twice as big as she needs on her collective farms, even at peak seasons. The average per capita man-days registered by collective farms in the north-west of the Russian Federation is 255, while in Georgia the figure is only 148.

Why do young people migrate from the villages? At least two factors operate: desire and possibility. The possibility is limited by the labour requirements of the urban centres.

The desire to change residence has a host of underlying reasons. Most of them flow from the economic disparity between town and country. The countryside is still way behind the town in terms of wages and living standards. ☛

It is only natural for man to seek better opportunities. This is one of the laws of life, and a law of economics, too.

Villagers and townsfolk may have different ideas of "better opportunities", hut the difference is fading fast.

This is illustrated hy the results of recent sociological research, a study of attitudes towards different occupations and professions—an investigation vital to an understanding of rural migration.

Urban life preferred

It showed that agricultural work is unpopular with youth in hoth town and country. Though the younger generation in the countryside sets a little more store on farm work, the overall conclusion is that relatively well-educated young people prefer urhan ways of living.

Consequently, rural areas have a vast number of potential migrants. But the state would benefit if young people came to towns only from areas where there is too much agricultural labour, instead of from rural communities where it is in short supply.

The prohlem calls for migration control, which can only be achieved hy correct economic methods.

The most important thing is to achieve and maintain the living standards in different parts of the country so that a person with a trade or profession must enjoy higher living standards in areas where labour is scarce than his counterpart does in an area where there is a surplus of labour.

Much has been done towards this end lately. All workers in the North and Far East of the USSR have been receiving higher wages since January 1, 1968.

The maximum rise is 100 per cent, or up to 300 roubles a month.

Is it harmful?

Labour fluctuation is caused hy workers leaving johs of their own free will.

In leaving johs people are motivated hy an urge to better living and working conditions and higher pay—the same motive that causes country people to move to the cities.

To the factory, farm or institution, labour fluctuation does nothing hut harm. But if one takes the hroader view, the process can be appraised differently.

Peak labour fluctuation is ohserved in the huilding industry. Some workers leave their johs to take other construction jobs, but a larger proportion shift to other industries or even to other hranches of the economy.

Most vacancies are filled hy newcomers from rural areas. After a while some of the newcomers also move to other spheres of employment, thus making room for still another wave of country migrants.

The lion's share of new settlers—hundreds of thousands of young people annually—come to urhan centres through johs in the huilding industry.

The process is hardly beneficial for the industry. But how ahout society as a whole? So far, because of extensive construction schemes, lahour, especially machine operators, is in great demand. In other words, the huilding industry needs precisely those people that the villages have got.

At the same time, countrymen usually have not acquired the knowledge or skills needed for work in industry. They can achieve the required professionalism only hy a sufficiently long stay in town.

Building johs offer a way to move from countryside to town and a chance to become adapted to the urhan world.

Once the villager has lived in a town and acquired new skills, he has better opportunities open to him—something he did not have when he was fresh from the country.

The link and the benefits

Broadly speaking, lahour fluctuation in the huilding industry has so far provided a necessary link in the overall chain of labour redistrihution between the different hranches of the national economy.

Labour fluctuation has more benefits than one. Quite often people work at johs which are way below their capacity, or are not in their line at all. An extensive research into fluctuation in the industries of Leningrad revealed the following:—

Among the workers who have changed johs, the lowest industrial grading has been retained hy only 50 per cent, while 24 per cent have had their gradings raised to second, 12 per cent to third, 10 per cent to fourth and 4 per cent as high as fifth or sixth.

Thus, their change of johs has not only benefited half of the people directly concerned, hut also has greatly benefited society as a whole.

There is another aspect to the prohlem, however. Labour fluctuation results in lower labour productivity, expenditure on extra training and retraining of labour, extra wear on equipment, and other losses. So not every change of joh by personal decision of the worker is welcome.

Lahour fluctuation is a natural process, something necessary and inexorahle, something that cannot he aholished or avoided, hut something that needs careful control.

That calls for a clear understanding of its positive and negative aspects. The reasons for harmful fluctuation and migration must be discovered in order to be removed, mostly through economic machinery. The socialist system of economic management makes that possihle.

Let man find the work that suits him best. The government's task is to run things in such a way as to make what is necessary for the individual hecome also a henefit to society.

OLGA BERGHOLTZ

by Alexander YASHIN
from the newspaper LITERATURNAYA ROSSIYA

poetry of the siege

THEN · An old couple on their way along Leningrad's war-ravaged Nevsky Prospect to bury their dead.

From 'LENINGRAD POEM'

[illegible] a Rubicon. I remember
[illegible] evening [illegible]
[illegible] hurrying to [illegible]
[illegible] for [illegible]
[illegible] [illegible] page, [illegible] said.
[illegible] jacket [illegible] no. [illegible]
[illegible]
My [illegible]
[illegible]
[illegible] once a mother. Have you forgot
[illegible] our child's [illegible]
[illegible] will [illegible]

[illegible] [illegible]
[illegible] room
[illegible] women, stricken
[illegible] deadlocked as [illegible] doom.
[illegible] thousand [illegible]

Ah, how bitterly then humbly
She pleaded. How she [illegible] to
My heart. But I resisted dumbly.
My bread should buy no coffin.
Resisted, but drew her to [illegible] table
And sat her down and fed her bread
And said: 'Forgive me. Not [illegible]
My bread. The [illegible] must be fed.

[illegible] February, February [illegible]
[illegible] with [illegible] pang of joy I say again:
All things shall be given to the living,
[illegible] withheld, neither [illegible] pain
[illegible] do I [illegible]
And in the name, the sacred [illegible]
[illegible] who [illegible]
[illegible] [illegible] breath [illegible] life [illegible] me.
Countless they [illegible]
[illegible]
Life possible in the [illegible]
[illegible] Leningrad [illegible]

[illegible]

NOW: The Eternal Flame in Piskarevskoye Cemetery, Leningrad, where over a million war dead—soldiers and civilians—are buried. About 600,000 were civilians who starved to death.

As I turn the pages of the book of memnry,
I cnme upon the earliest songs I made:
"O'er Neva's sunset waters hangs a star,
And nightingales are singing io the glade."

The tide nf years my little bark has tossed
To heights and depths in dizzying sway,
And you were right, my first lnve and my lnst,
I sing, I weep, nf other things today.

But youth sings still the same old songs,
Of stars and nightingales and evening light;
The same sweet longing in their snngs is heard,
And now, as ever, youtb is right.

1940

* * * * *

Never have I of my feelings heen sparing,
In snngs, in friendship, in sornnw nr hliss.
Forgive me, heloved, faults past repairing,
I suffer—
yet happiness lies in all this.
And nnw when my spirit is anguished and lonely,
Sn fearful of facing calamities oew
That I shy at the shadow of trnuhle, at nnly
A phantom—
happiness lies in this, too.
Oh, let me weep forever and ever,
Hurl hitter reproacbes, reproacbes endure!
Much wnrse would it be to forgive. Love never
Forgives—
but this is happiness sure.
Love shares nnt its pnwer, asks for nn pity,
Tnrtures its victims with ruthlessness,
When love is splendid, when love is living,
Wheo love is nnt pleasure hut happiness!

1952

* SHOES ALL ROUND *

(from the magazine NOSKY)

A teenager walked into a jeweller's shop, hoping to sell a stone and raise enough money to huy herself a pair of shoes. The stone she took for rock crystal had heen given to her at the age of three, when her mother found a tasteless, glittering necklace among her grandmother's effects.

Mother dismissed it as unwearahle and passed it on as a plaything to her child.

All the other children in the street played with it over the years. It hroke, of course, and eventually just the higgest stone was left.

The Buhnov family were staggered when their daughter arrived home and announced that she'd been offered more than 50,000 roubles for it. It turned out to he a 16.77 carat precious stone! They went hack together and got 56,000 rouhles on the spot.

You can hear plenty of fascinating stories like that in the Director's office of the Central Depot of "Rosyuvelirtorg" (Russian Federation Jewellery Trade).

One interesting ohject brought in was a boat-shaped silver vase, with a picture engraved on it—a barren rock on which stood an officer with unsheathed sahre, and two sailors. Valour was written all over them.

This vase had probably heen presented to some renowned navigator or explorer, and possibly the craftsman who made it had depicted an event from his own life or the lives of people closely associated witb him.

In any case it is one of those unique works of art created hy Russian goldsmiths and silversmiths of old whose names are only now gradually coming to light as a result of patient research.

Once a second-hand purchasing office in Tashkent paid a vast sum of money for half a kilogram of coins of the lowest-grade gold. It was even decided to prosecute the chief huyer for what appeared to he criminal negligence, and, in order to assemhle expert evidence, the coins were submitted to the State History Museum.

The buyer was more than saved. It turned out that he had acquired a unique treasure dating hack to the 12th or early 13th century. Among the coins were small fragments of gold, and for the whole collection the museum was willing to pay infinitely more that the "exorbitant" sum for which the coins had been bought.

Experts have just started a study of the collection, and it is already clear that it gives an excellent idea of monetary circulation in a period which has left hehind remarkahly few relics of its material culture.

About Soviet Schools . . . *Continued from page 15*

The government does its best to help them. At evening schools there are shift systems—classes are provided at times to fit in with those who work on day or night shifts.

By law, factory managements grant worker-students paid leave at examination time. Workers who study at evening or correspondence schools are also entitled to one shorter day a week on full pay or to an extra day off at half pay.

The following figures show how popular evening and correspondence schools are throughout this country. In 1958-59, the number of students at these schools amounted to 1,900,000, and in the period 1967-68 it reached 4,500,000.

In the 1960s new types of correspondence and evening courses have been launched. For example, those who previously studied at any other courses and are, therefore, experienced enough to work with a textbook without teacher, are given a more compressed programme to cover in a shorter time. So, instead of four years, the programme for the fifth to eighth forms in city schools is covered in two-and-a-half years.

In the countryside, where the school year for adults (because of seasonal work) is eight weeks shorter, the school curriculum is spread over three years. This explains why evening schools in the country have an 11-year curriculum, and not a ten-year one as in cities.

In 1962, the government set up special on-the-job training courses for workers who wanted to improve their skills and also to get a secondary education.

In 1964 special courses for skilled workers at small factories were opened at evening schools.

In the republics

There are two types of school in the Soviet national and autonomous republics. In the first group all teaching is done in the language of the republic, while in the second group tuition is carried out in Russian.

At first glance this system looked as though it fitted the bill. But actually this is so only in republics where all the people speak the same language.

And what about a republic like Georgia, for example? This republic has a very mixed population—Georgians, Russians, Armenians, Azerbaijanians, Abkhasians, etc. In 1965–66 the republic had 4,280 schools: 2,976 Georgian schools, 291 Russian, 242 Armenian, 162 Azerbaijanian, 39 Abkhasian, 194 Ossetian, and 376 mixed schools where tuition is conducted in two languages—Georgian and Russian, Georgian and Armenian, Russian and Armenian, etc.

The choice of school rests with the parents, of course.

Supposing a child is sent to an all-Georgian school. In that case he would be taught Russian as a foreign language, on an equal footing with the western European languages.

In the autonomous regions—for example, the South Ossetian Region, which is part of Georgia—the Russian language is not compulsory at school, nor is the Ossetian language compulsory at Russian schools of that region. But in both schools, Georgian, as the official language of the republic, is compulsory.

With a knowledge of Georgian, a student of any nationality living in that national republic can later advance his education at a Georgian college or university. He finds this language necessary in order to live and work in this republic, just as a knowledge of Russian would be necessary if he wanted to enter a college and work in a Russian-speaking part of the Soviet Union.

Georgia is a land of mountains and has a large number of small villages dotted about. Naturally, there are many small schools there, too. Back in 1966 there were 321 schools with up to 10 pupils in each.

The number of such small schools has lately been reduced, as many of them lack skilled teachers and the necessary educational aids. Instead, boarding schools are being set up where education is provided in the Georgian, Russian, Armenian, Ossetian, and Abkhazian languages. At present more than 8,000 children study at these schools in Georgia.

Boarding schools, in general, became fairly widespread throughout the Soviet Union in the 1950s. Parents make a contribution, depending on their income, to the cost of the child's board and lodging; but most of the expenses are borne by the government.

★ ★ ★

There are many other aspects of Soviet school education which might be dealt with, but the purpose of this article was to give a general idea of Soviet primary and secondary schools and their place in society today. Further information will be published in subsequent articles.

Words and meanings

Anatole France was interviewing a young stenographer who had been recommended to him by one of his friends. He asked her, "I hear that you are a pretty good short-hand writer?"

"Yes, I can take 130 words a minute."

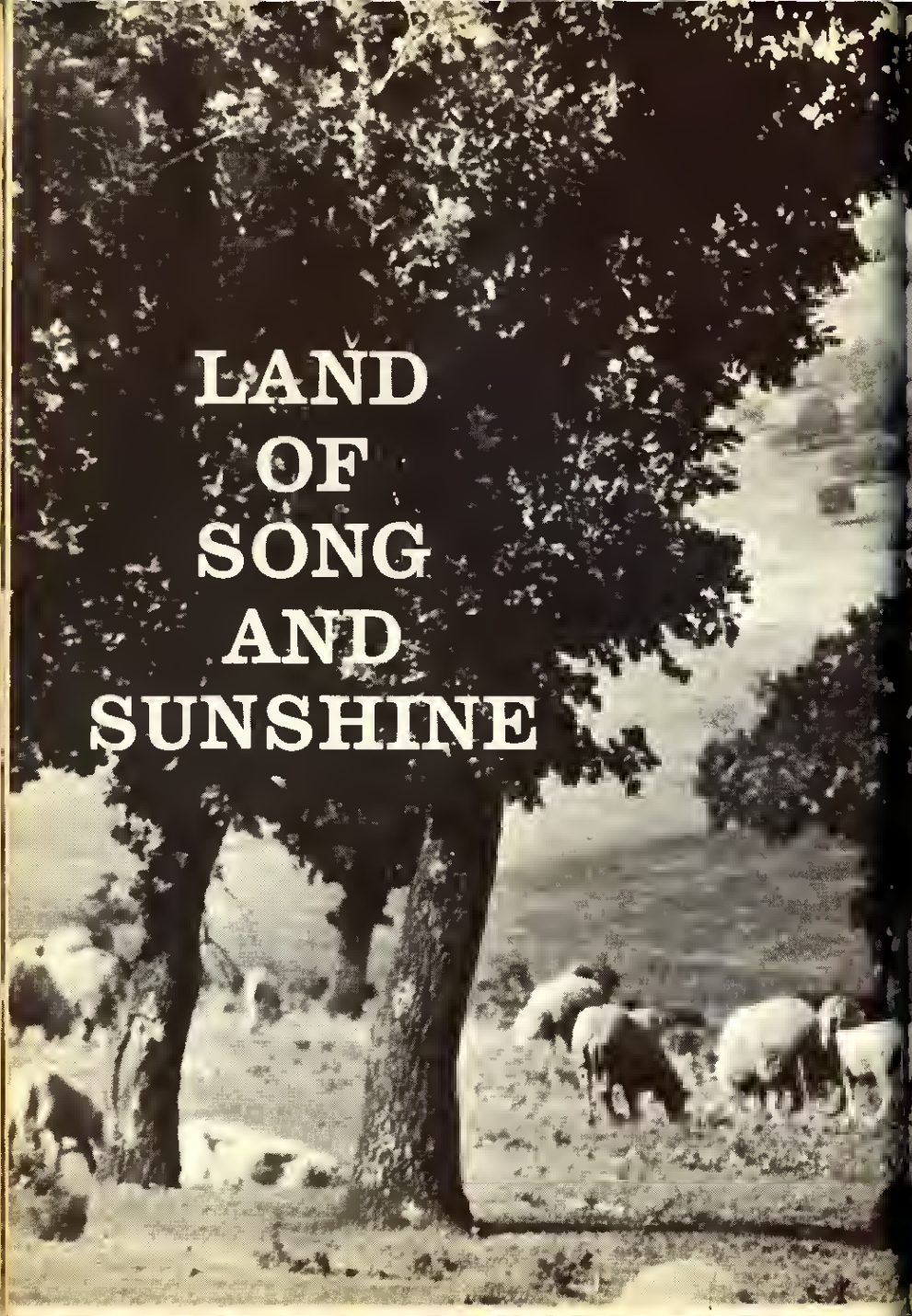
"My dear girl, you can't expect me to come up with that much!"

★ ★ ★

The German physicist Otto Hahn was asked what he thought of metaphysics.

"Metaphysics," he said, "is looking for a black cat in a dark room where there are no cats at all."

LAND OF SONG AND SUNSHINE



On the map, Moldavia looks something like a bunch of grapes—highly appropriate for a country famed for its vineyards. Situated in a western corner of the Soviet Union, it covers an area of 13,000 square miles and has a population of three million.

from APN NEWSLETTER

ONE-QUARTER of all the vineyards in the Soviet Union are in Moldavia. The republic provides one-third of the total national grape harvest.

The land is fertile, but arid. Hence water has always loomed large in national customs and traditions. A well would usually be dug to mark a great family event, such as a marriage or the birth of a baby. They were dug in the villages and by the roadside in desolate places, and were often marked by a carved wooden crucifix, which could be seen from afar by the weary traveller.

Today in areas situated far from rivers, artesian wells operated by powerful electric pumps are the main source of water. An irrigation network stretches from the River Dniester to the River Prut, and work is in hand to irrigate another million and a quarter acres of land.

Anyone who travelled through Moldavia before the war or soon after the republic was liberated from the Nazis would not recognise the villages today. Sociologists who visited the village of Copanca in 1938 wrote: "The villagers sow by band and reap with scythes. The peasants are exploited mercilessly by speculators."

Now Copanca has two secondary schools, and also nursery schools, a hospital and a club. Work that was done by hand in the past has been taken over by tractors, harvesters and other agricultural machines.

The collective farm's annual income is almost two and a half million roubles. Every farmer earns an average of 100 to 120 roubles a month in cash, plus payments in kind. The situation is much the same all over the republic.

Moldavia's collective and state farms own 40,000 tractors, 10,000 harvesters, 15,000 lorries and more than 30,000 electric engines. All this machinery enjoys air support—agricultural planes spray insecticides, pollinate fields, and so on.

The republic's intensive agriculture determines the direction of its industrialisation. Food industries account for some 60 per cent of overall production.

Moldavia takes third place in the USSR for output of tinned fruit.

Wine-making is the leading industry. Many of Moldavia's top vintage wines have won gold medals at international tasting competitions. In Tbilisi, capital of the Georgian Republic, the wines of the Moldavian Ciumai state farm won five gold medals in 1965. Altogether, Moldavian wines have captured 96 gold, silver and bronze medals in the past few years.

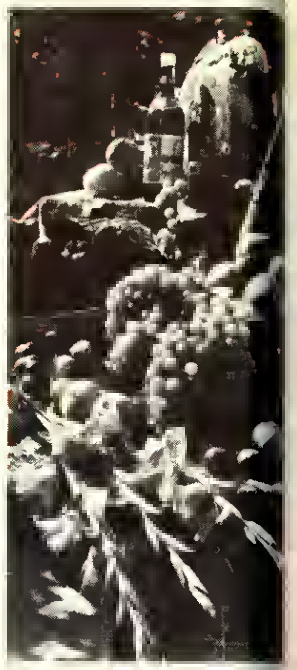
Moldavian-bottled wines have a

continued on Page 90

Above: A Moldavian lass enjoys herself with the rest at a village wedding.

Above: Petru Stuparu, member of a fishing co-operative on the River Prut.

Above: The beautiful River Dniester, dividing the Moldavian Republic from the Ukraine.



Above: Moldavian still life. Woven rug and pottery wine jars are typical, too.

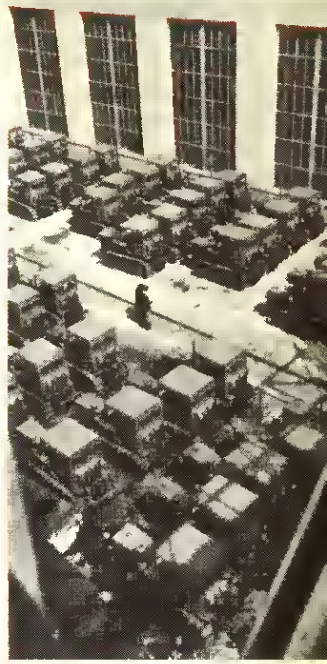
Below: Serious work in progress in wine cellar of the Kishinev School of Grape-growing and Wine-making

Above: Spraying a collective farm apple orchard in Spring.

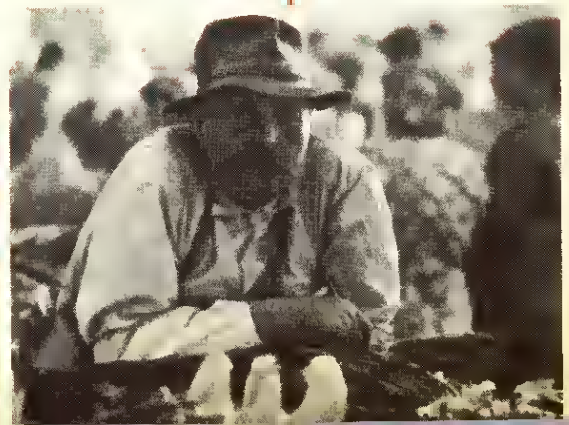
Above: Dr. Birsan sets off by helicopter from Kishinev to see a patient in the country.

Below: Chickens being reared the streamlined way at Dubossari

Below: Countryman with his wares at market. He could be leaning on a five-barred gate



Above: Products of the Kishinev Tractor Plant. Most farming work in Moldavia is mechanised these days



variety of colourful labels, but on each there is a white stork with a cluster of grapes. According to legend, five centuries ago Moldavian troops were defending a fortress against invading Turks. The besieged ran out of water. Death or defeat seemed imminent. And then storks came flying in with bunches of juicy grapes. The weakened warriors quenched their thirst. Reinvigorated, they stormed out to rout the enemy.

The majority of the population (65 per cent) are Moldavians. The rest include Ukrainians, Russians, Bulgarians, Gagauzi, *(see page 98)*, Armenians, Jews and Gypsies.

The people of Moldavia have long been known for their hospitality. They are always happy to invite visitors into their homes. Many houses are adorned with wood carvings, and inside lustrous ceramics, colourful embroideries and painted designs decorate the walls.

A guest is always offered fragrant home-made wine, succulent barbecued pork, perhaps a cold chicken with garlic, and a variety of vegetables. A speciality of Moldavia is the famous *mamaliga*—a thick cornmeal porridge served with sour cream, brinza (goat's milk cheese) or onions fried in lard.

National costumes are still a common sight in Moldavian villages. Men wear embroidered sleeveless sheepskin jackets fastened at the waist by a crimson sash. The traditional headgear is a tall cocked astrakhan hat, or a black felt one. The men's snow-white shirts and the women's blouses are embroidered with Moldavian designs.

Moldavia is a land of melodious songs and fiery folk dances. Singing can always be beard in the vineyards and orchards. In the evenings, especially on holidays, violins and tambourines are heard in every village. A festively-attired crowd gathers in tbe village square to begin what the Moldavians call *joc*—tbe word means a dancing game.

Tbe lithe figures and beautiful dark-eyed faces are a compelling sight. Moldavian music and dances are highly distinctive, vivid and spirited.

Moldavians' love for music and dancing bas produced an abundance of amateur cboral and dance groups, both in the cities and countryside. These groups offer an excellent training to budding talents, many of whom develop into professional vocalists or dancers.

Kishinev, the capital of Moldavia, is located in the eastern foothills of the Codri range. Residents tell you tbeir city, like Rome, is built on seven hills. And as the god Bacchus likes hills and slopes, the fertile hills around Kishinev are ideal for producing wines, especially cbampagne.

The city itself is a sea of greenery. Every courtyard has plum, cherry and apple trees. Orchards and vineyards are wedged in between the houses and form rings of verdure around them. Streets and squares are carpeted with flowers.

Kishinev, with a population of around 300,000, is the republic's industrial and cultural centre. Its factories turn out electric pumps for artesian wells, small tractors for work in the vineyards, refrigerators, washing machines, micro-wire (thinner than a human hair), oscillographs, and many more items.

Kishinev University bas a student body of 8,000 and the Polytechnical Institute has an enrolment of 5,000. Other higher educational establishments include an agricultural training college.

The pride of the capital is the Moldavian Academy of Sciences—a large centre of research into a wide range of practical and theoretical scientific problems. Established in 1962 as a branch of the USSR Academy of Sciences, it now has a scientific staff of about 4,000.

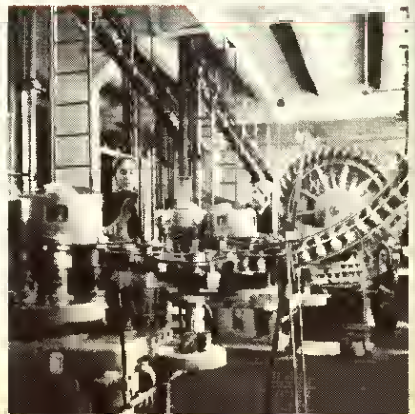
The storks of Moldavia are both symbol and legend

Top. Children from a new suburb of Kishinev, the Moldavian capital.
Above: Kishinev University student hard at it.

Top: Oscillographs made in Kishinev have memory devices to prevent accidents.

Centre: Electrical equipment made at a factory in Tiraspol.

Bottom: Tiraspol cannery where some of those luscious vegetables and fruit are preserved.



Soviet Moldavia: facts and figures

● MOLDAVIA is a land of sunshine, grapes and wine. Her 250 wineries turn out more than 100 different wines and brandies. The most popular are the white table wines, which compare favourably with the choicest of any country.

★ ★ ★

● ORCHARDS and vineyards occupy more than a million acres in Moldavia. On an average, the republic sells the state five kilograms of fruit and grapes a year per head of the population of the entire Soviet Union (including children).

★ ★ ★

● THE INDUSTRIES of Moldavia employ 450,000 workers. Since the Second World War the republic has built 160 large factories, which export to 54 countries.

★ ★ ★

● MOLDAVIA'S top legislative body is the Supreme Soviet. In the last elections held in the Spring of 1967, 315 members were elected to the Soviet, 56 per cent of them industrial workers or farmers.

★ ★ ★

● PRESIDENT of Moldavia is Kyrill Ilyashenko. The son of a Moldavian peasant, he was born in 1915. He worked as a collective farm assistant accountant, a schoolteacher and a journalist before assuming his present office. Last year he was re-elected for another four-year term.

★ ★ ★

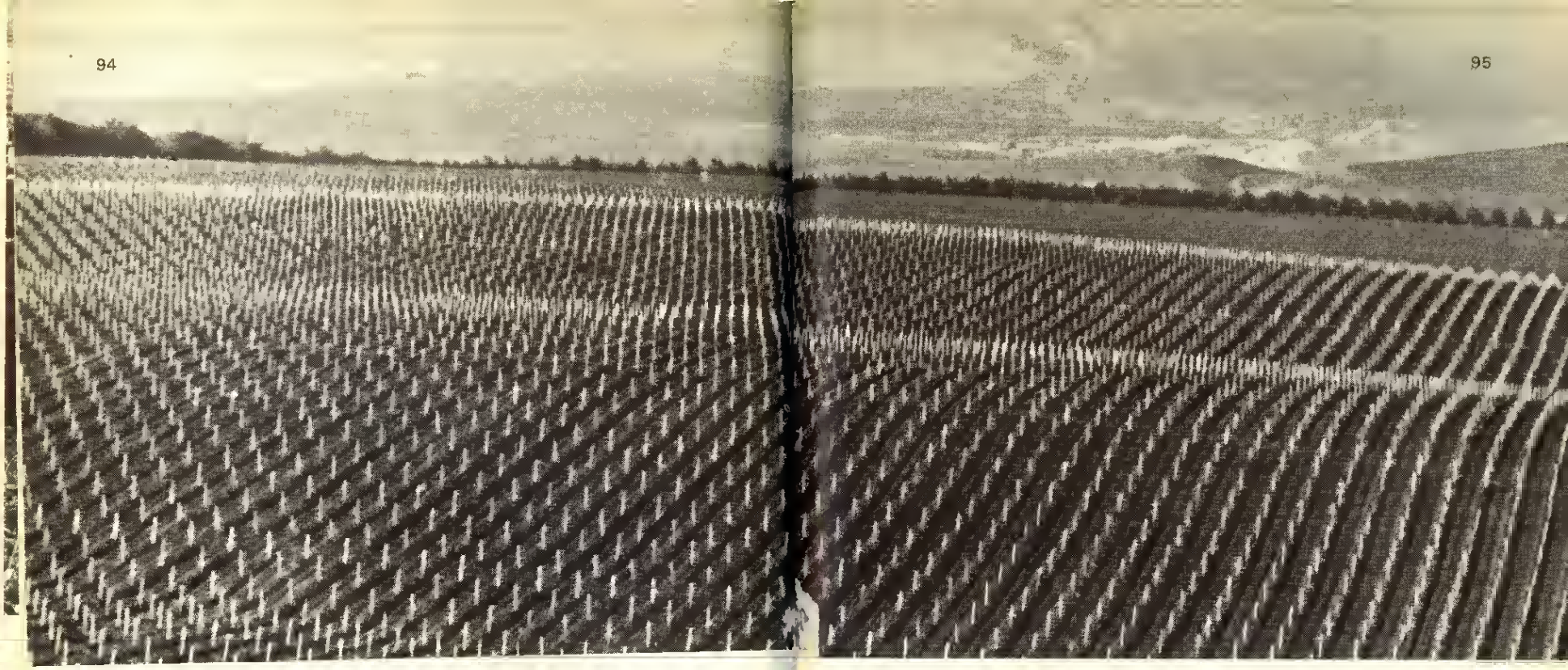
● OUT OF its 1968 budget of 641,643,000 roubles, Moldavia is spending 347,784,000 roubles on public education, medical care and social insurance.

★ ★ ★

● SINCE the establishment of Soviet power, a university, four colleges, 40 research institutes and the Moldavian Academy of Sciences have been opened in Kishinev, the capital.

★ ★ ★

● TWO MILLION people are regular visitors to Moldavia's 4,000 public libraries. In 1967 Moldavia published 1,507 books, running into seven million copies.



Primavara—a wine for lovers

by Galina KULIKOVSKAYA

condensed from the magazine OGONYOK

The entrance to the underground city is hewn out of the mountainside. Above the portal, the emblem that decorates all bottles of Moldavian wine—a flying stork with a cluster of grapes—is emblazoned. Inside the mountain it is cool.

Krikovo is a planned city. Neon signs point directions to various districts—Champagne, Red—and street names inform the visitor where he is: Feteasca, Cabernet, Aligote, Riesling. Instead of houses, the 3 miles of streets are lined with monotonous rows of thousands of wine casks, the edges of which are neatly outlined in white paint.

Krikovo is the largest wine-cellar in the country, with a capacity of one million decalitres. The year-round temperature in the caves is an even 50 or 51.8 degrees Fahrenheit—perfect for table wine.

The production of Moldavia's vintage wines is concentrated here. In glass cases in the wine-tasting hall, gold and silver medals glitter on velvet cushions, visible proof of the success enjoyed by Moldavian wines in both national and international competitions.

Reverently we approached a table on which fragile wine glasses were set out. One wine was almost colourless and smelled of sweet meadow grass. Another was harsh, wafting a scent of bitter almond blended with violets.

The experts talked.

Here is Brut, they said, a type of champagne. It is made without any sugar. The ruby foam frothed and bubbled in our glasses. We were told it was valued at ten times the price of sweet champagne.

Next we tried Negru de Purcari, a velvety red table wine reminiscent of blackcurrants. Two generations ago this wine enjoyed a world-wide reputation, but in 1910 a plague called phylloxera attacked the vines and destroyed the grape-growing areas of Purcari. To the chagrin of connoisseurs the wine disappeared from the market.

In the 1950s a grape-growing expert named Pimen Cupcea determined to rediscover the secret of

A wine-tasting session—in this case the ladies seem to be drinking brandy.

Negru de Purcari. After several years spent on selecting and crossing varieties of grapes grown in the Purcari district in the lower Dniester valley, Cupcea was able to re-create the wine. Today Negru de Purcari is once again in demand, both at home and abroad.

And finally, with some fanfare, we were presented with a wine we were told was the newest to be developed at the Kishinev School of Grape-Growing and Wine-Making, which recently celebrated its 125th anniversary.

One of the leading schools in its sphere in the Soviet Union, it has a large experimental farm at Gratiesti: 1,200 students from all parts of the Soviet Union study there.

Among its graduates are well-known figures in the world of winemaking. One such is Dr. Pyotr Unguryan, a Corresponding Member of the Moldavian Academy of Sciences. This scientist has advanced a theory easing the production of light, low-acidity wines and, incidentally, providing the recipe for the wine we were now sipping.

"Any wine, in its time, in the right place and with the right girl," one of the experts said with a grin. "This is a wine for Spring, a wine for lovers. It is called Primavara, which means 'spring' in Moldavian."

It was indeed light and redolent of blossoming orchards; a fragrant bouquet of spring and sunshine.

The new wine is produced by a blending of white Muscat with Aligote grapes. Experts know how difficult it is to make dry Muscatel. Muscatel tends to be bitter and over-pungent, and the comparatively neutral Aligote was used to "cut" the Muscatel. The question was: in what proportions?

Starting work in 1963, wine makers carried out scores of experiments to determine the percentage (three-quarters Muscat to one-quarter Aligote, it turned out), and to discover at what point the process of fermentation should be halted.

Primavara, in its short life, has already won two gold medals, one at Tbilisi and the second in Sofia in 1966.

Lovers please note: a separate, two-storey building for the production of Primavara is being added to the winery at Gratiesti. An annual output of 500,000 decalitres is planned—a whole river of Primavara.

THE GAGAUZI PUZZLE

by Alexei ROMANOV

from IZVESTIA

In the eighteenth century a mysterious people, the Gagauzi, appeared in the steppe country of what is today Southern Moldavia.

They were Christians, and had fled from the Balkans to escape Turkish slavery. Together with their flocks of sheep they crossed the Danube and settled in the Bugeac Steppe between the Prut and the Dniester rivers.

The Gagauzi appeared to be a distinctive national minority, a people quite apart from those found in the Balkans.

An ethnograpber who visited their villages towards the end of the nineteenth century wrote: "Curiously enough, everyone here knows the Gagauzi perfectly well and never confuses them with Bulgarians. But officially there are no Gagauzi. They are registered as Turkish-speaking Bulgarians."

Many theories have been put forward as to their origin. Soviet scholars increasingly incline to the view that the Gagauzi are descendants

of nomad Turkic tribes that settled in the Balkans in the 12th-13th centuries and adopted Christianity while retaining their native tongue.

Life in their new country was hard for the Gagauzi. Water was scarce. Black sandstorms whirled across the steppes, destroying crops and pasture land. Drought parched the land.

The once proud and ambitious Gagauzi grew passive and indifferent. The will to live was flickering out. They were a people on the verge of extinction. The old ones said that the wolf, who was their protector, had lost his fangs.

Today 100,000 Gagauzi live in their Bugeac Steppe. Far from extinct, they are flourishing. Their once high infant mortality rate has been cut and the Gagauzi are a fast-growing national minority. Five and six children in a family are usual and 10 or 12 not uncommon.

The Gagauzi village of Kirsovo has new brick houses lining the road, all with peaked tiled roofs and verandahs wreathed in ivy and vine. After the war the village had exactly seven horses and four donkeys. But today the collective farm income averages three million roubles annually.

Village boys who were sent off to study have returned to become livestock experts, veterinary surgeons, agronomists, engineers, teachers. In the past two years a nursery school and two new schools have been built, and a store and a telephone exchange opened.

The story of Kirsovo is repeated in every Gagauzi village. Where squalor and apathy reigned, industry and ambition rekindled have created well-being. Healthy brown children swarm through the streets and parks of villages and towns. Life-giving water has brought green to the steppes.

The village of Besalma gave the Gagauzi people their first doctor, Ivan Topal, their first composer, Nikolai Chiose, and their first scientist, Boris Tucan, now on the staff of Moldavia's Academy of Sciences.

A schoolteacher in the village, Dmitri Caracioban, is a remarkable man—painter, sculptor and historian. He wrote the first collection of poetry to be produced in the land of the Gagauzi, directed its first films—documentaries—and set up a village museum.

The museum offers a panorama of Gagauzia today. Among its exhibits is the first Gagauzi literary almanac, the first newspapers and the first grammar book.

The History of Gagauzi Grammar was produced by Ludmilla Pokrovskaya, a philologist from Moscow. Over a period of several years she made frequent visits to Besalma with her tape-recorder, speaking for hours with the old people, recording sagas, proverbs and sayings such as, "May the wolf punish you", still heard to this day among the Gagauzi.

Kirsovo . . . Besalma . . . Congaz, with its thriving population of 11,000 . . . Cioc-Maidan, a village straddling two high hills rising from the plains . . . And everywhere new homes going up, orchards and vineyards, irrigation systems, schools, and a cheerful, suntanned people, working, building and no longer fearing extinction.

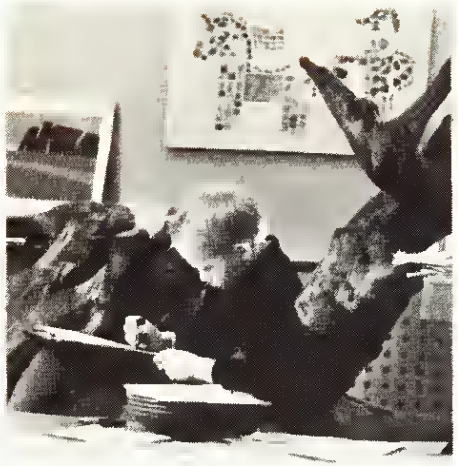
The Dance Ensemble from the Benderi Silk Works chooses a fine setting for a performance.

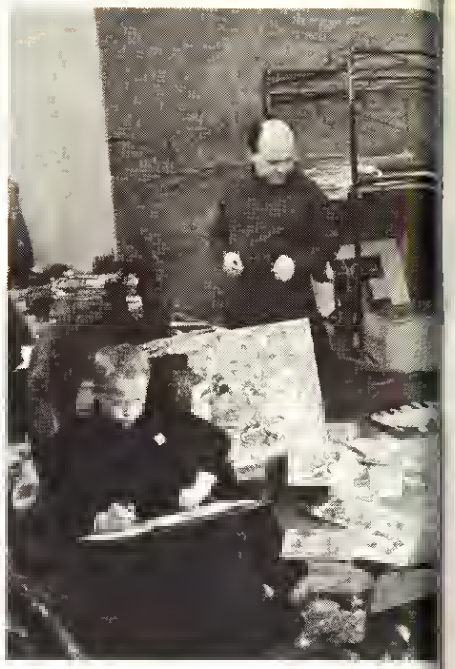
The Three Musketeers

Young Igor paints and paints

Madonnas

by Alexei ZHIGAILOV





IGOR Sokol is not eleven yet. He lives with his parents in Akademgorodok, Siberia's famous Science Town not far from Novosibirsk.

Igor's father, Vladimir, is an artist who has painted the decorative panels and murals for many buildings in this young Siberian town, including the Institute of Nuclear Physics, the Scientists' Club, and the Golden Valley restaurant.

Like most children, Igor bas loved to draw ever since he can remember. And as time bas gone by be has loved it more and more—and no douht father's example has had something to do with it.

For some years now Igor has spent hours every day drawing or painting on great sheets of cartridge paper, in innumerable albums, or in plain ordinary exercise books. He uses a fountain pen and water colours, but best of all likes a variety of coloured felt poster pens.

He will sit quite alone, working patiently and painstakingly over his paintings and drawings, and as soon as he has finished one he is off to show it to Dad.

Father is very careful about the way he treats his son's work, and tries not to force any formulas on to the boy. He does not want to cramp Igor's imagination or impose his own taste.

Igor has an astoundingly rich imagination. His pictures show a whole fantasy world, in the bright colours of childhood. Yet it is a world that has, too, the romance of youth and the wisdom and harmony of adulthood.

He paints scenes and characters from all his favourite stories—Russian, English, Spanish or French; from the avidly devoured books of Pushkin, Cervantes, Dumas, Sir Walter Scott, Le Sage and many others. He has Don Quixote, Russian knights, kings and freedom-loving outlaws, medieval shopkeepers, soldiers, madonnas and musketeers.

His dedication to his favourite occupation has helped him to develop such essential qualities as sureness of line, plasticity and sense of colour to a degree beyond his years.

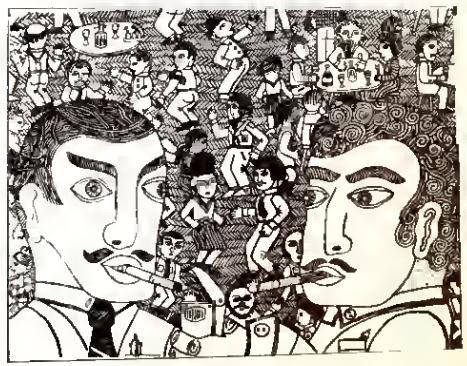
One of tbe most surprising things about Igor's pictures is that although at first glance one gets the impression that the subjects, composition and colour schemes are borrowed from works he has seen, it soon becomes clear that everything is his very own. Everything that seems so familiar is nothing of the sort, but is portrayed with tremendous individuality. It all bears the unmistakable imprint of Igor's personality.

He is not one of those infant prodigies who can copy so brilliantly but can do nothing without other people's ideas and discoveries. He thinks things out for himself.

Some of his pictures are amazingly complex. There is a wealth of detail, but it is not due merely to a child's desire "to get everything in". It all has a purpose in tbe composition.

So far Igor has not shown much interest in painting scenes from wbat he sees around him, but when he does—as in his "Youth Café"—he reveals a keen sense of observation.

Now he has his first one-man show, at the Novosibirsk Picture Gallery.



Youth Café

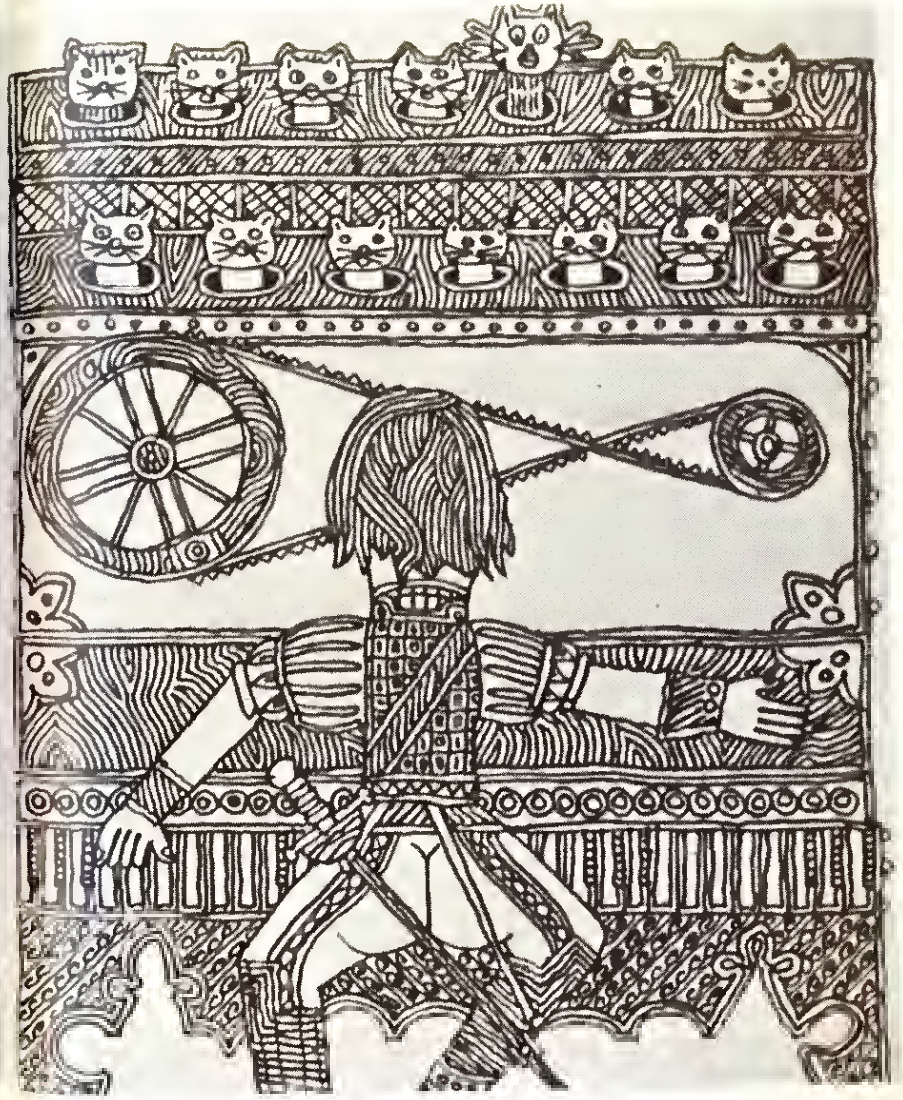
The Court

Noah's Ark

Pan Playing his Pipes

Russian Fairy Tale

The Book Printers



The Musical Box

THAT IMPULSE HELPED

by Gennadi Muravin

On the spur of the moment, a stranger spoke to the unhappy girl forlorn in a Moscow street . . . and that's how Lyuba became the sparkling star who is featured on the following pages.

At 18 she went to the big city to prove she had talent. She was too late; the doors were closed . . . until a chance meeting.

Lyuba Polishchuk with members of the Omsk Veriety Orchastra.

Fairy godmothers can assume many shapes and disguises, even the unlikely one of a journalist.

Three years ago a Moscow journalist of considerable stature noticed a tall, slender, rather angular girl walking along a crowded Moscow street. Her head drooped, she was a million light years away and it took no professional gift of observation to see that the girl was desperately unhappy.

A failed exam? An unhappy love affair? Then the journalist noticed that she was not even carrying a handbag. Perhaps she had lost her purse and all her money?

She looked so forlorn, so miserable, that he had an impulse to speak to her. He caught up with the girl and asked if he could do anything to help her. She reacted the way most young girls react when a perfect stranger accosts them in the street. She stared coldly at him with her great big, blue-grey eyes and tried to brush him off. However, he persisted and half an hour later, over a cup of coffee, she finally told him her story.

Her name was Lyuba, she was 18, her father was a cabinet-maker and they lived in Omsk. She had come from that remote city in central Siberia two days earlier to apply for admission to the Maly Theatre training school, but found she was too late. No more applications were being accepted.

It had taken her too long to convince her mother that the only thing she wanted to do was act, and that she had to go to Moscow to prove that she really did have a talent.

Lyuba had spent the whole of the previous night at the railway station, tortured by indecision. She was wavering between returning home without having achieved anything at all, and trying to stick it out in Moscow and somehow show that her ambitions were not a self-delusion. But how? She had failed to become an applicant, let alone a student. She did not have a single relative, friend or even acquaintance in Moscow.

On the other hand, returning home would mean acknowledging defeat and would lead, she knew, to endless frustration. She needed a miracle. And how could she guess that the pleasant-faced, slightly greying man who had suddenly spoken to her on the street was really her fairy-godmother in disguise?

★ ★ ★

I met her briefly after that crucial meeting which produced a decisive change in Lyuba's life.

Her new-found friend was determined that Lyuba should have a chance to prove herself. He made phone calls, contacted people he knew in the theatre world. Personalities she had known only from books or films interviewed her.

A noted composer and orchestra leader listened to her sing. And liked her. A poet wrote the lyrics for a new song, specially for her. She was to sing the song at an audition before the board of the Variety School of the Russian Federation.

The big day finally came. And, at last, the moment when Lyuba faced the examination board. A minute passed, then two. Lyuba shifted from foot to foot in the deafening silence. Stage fright!

An embarrassed smile lit up her face and she shrugged her shoulders. Suddenly the board hurst into encouraging applause. And that did it!

In packed halls or before these three, Lyuba holds the stage as commère, singer, dancer, and playing the guitar.

Whatever had momentarily blocked her was gone, and she sang, danced and talked to the members of the board with perfect ease. Lyuba was in.

The young students of the Variety School are taught singing, dancing, acrobatics, juggling, conjuring, make-up, stage presence and to play musical instruments. All Lyuba's instructors, eacb a star in the variety world, praised ber ability and hard work.

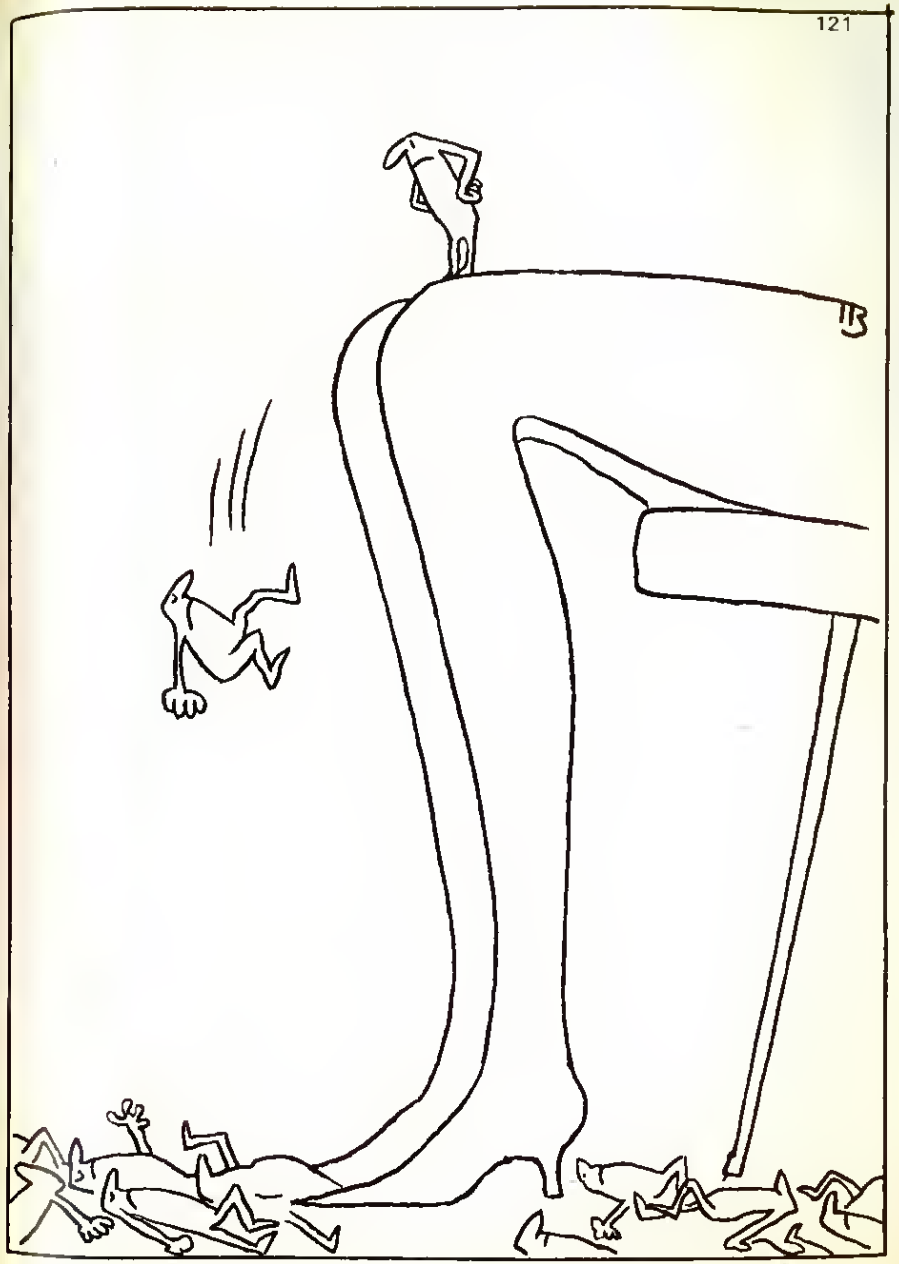
Eighteen months of work were wound up by a graduation performance, a variety show in two acts. The young students were an unqualified success and the class was invited *en bloc* to work with the Philharmonic Society in Omsk, Lyuba's home town.

Lyuba Polischuk is the star of the youthful company. She compères, sings, dances and plays the guitar. Wherever the group appears, whether in a small Siberian town or in Moscow's glittering Palace of Congresses, it plays to full houses. Lyuba's success is fully shared by her dedicated, enthusiastic, ebullient colleagues.

In the depths of her soul Lyuba still longs to perform the great roles of drama.

Having seen the girl from Omsk when she was still a wide-eyed neophyte, having witnessed her spectacular rise in the world of the variety theatre, I would not be at all surprised some day to see her in films or in the dramatic role of a Shakespearean heroine.

Today's a big day for Lyuba and the boys from Omsk—their first performance in Moscow.



THE RUSSIAN TROIKA

from the newspaper MOSKOVSKAYA PRAVDA

The stalls of these three noble animals are lined up in the order in which the horses are harnessed. In the centre is the shaft-horse Character, a trotter in the 2.10 class (this means he has done a mile in a time of 2 mins. 10 sec. in triple harness).

To the left of Character is a grey, a saddle horse of the Terek breed. This is one of the two trace-horses, Totsman, who is a little smaller than Character. He has been described by a rider as a fiery animal without guile.

On Character's right is Yakor, another grey, a racehorse as calm as Totsman is fiery. When Character, Totsman and Yakor are harnessed together, they form what is called a *troika*—this simply means trio.

Their driver is Vladimir Fomin, who has helped to revive an almost lost art. His first glimpse of troika racing was in an old painting. The shaft-horse was going at a swift trot and the trace-horses at a gallop, their heads a-tilt, "eating snow".

Once a groom looking after collective farm horses, Fomin is now a well-known rider and trainer, and has travelled with his horses around Europe and to America.

He has twice visited the USA. The first time was for three weeks: this was bow long American riders thought it would take them to learn to drive a troika bought from the Soviet Union. But after Fomin left for home, the horses got out of hand.

The Americans tried having three drivers at a time, one for each horse. But that did not help, for the horses did not pull together. So Fomin had to go back to instil some discipline into the trio.

In winter-time in Moscow, Fomin puts Character, Totsman and Yakor through their paces in the snow-covered walks of the Economic Exhibition. They are the traditional picture of the Russian troika, pulling a colourful sledge through the winter landscape.

The runners creak, the sledge is outlined in hoar-frost. The horses' hooves set the snow whirling like a snowstorm. Fomin rises in his seat, urging his horses faster, faster. The newsreel van, travelling alongside at about 30 miles an hour on the snow, falls behind.

The troika is a miracle of harmony. "Hey-ey-ey!" Fomin's voice rings out.

The troika speeds along as in that old painting: tbe shaft-horse at a swift trot, the trace-borses at a gallop, heads a-tilt.

Vladimir Fomin, well-known rider and trainer, with Character, the shaft-horse

INSPECTOR MAIGRET GOES TO LENINGRAD

by Tatyana LAZAREVA

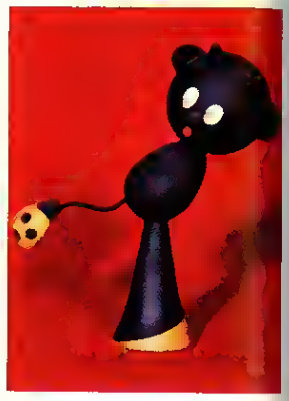
from the newspaper VECHERNY LENINGRAD

The indefatigable Inspector Maigret has turned up in Leningrad.

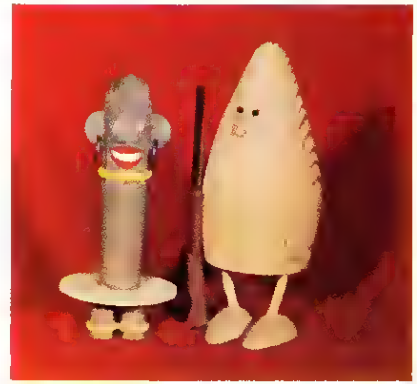
He is among the figures carved by Pavel Vandyshev, a young artist who comes from a longish line of wood-carvers.

By profession a sculptor — he graduated from the Sculpture Department of the Leningrad Art School this year—Pavel has developed a pleasurable hobby. He carves wooden toys for both children and grown-ups.

Maigret, of course, is for the adults. He is a heavyish, slightly somnolent figure, managing to look grumpy yet good-natured at the same time. He has the inevitable pipe between his teeth, and wears a velvet-collared



Above: The mischievous devil and the ladybird.



Opposite:
Left: Don Quixote and Sancho Panza. Tartarin de Tarascon.

Right: Mexican. Robinson Crusoe and Man Friday. Spanish Grandee.

coat, a bowler hat and hobnail boots.

In preparation for Maigret, Pavel set himself the enjoyable task of re-reading all the Russian translations of Simenon he could lay his hands on.

Anxious to know if he was on the right lines, he carved twin Maigrets and sent one off to Simenon for comments. Then he waited nervously.

From Simenon came a telegram putting him out of his misery: "Maigret magnificent, colourful. Congratulations to artist. Friendly greetings. Simenon."

Pavel has also carved a lifelike Charlie Chaplin, and innumerable characters from fiction.

There is a tall, gaunt Don Quixote, knight of the rueful countenance, in full panoply, rubbing shoulders with an important-looking fat gentleman wearing blue trousers and a red fez — Daudet's Tartarin de Tarascon.

There, too, are characters from Pushkin's abundant fairy tales —an astrologer in a star-spangled robe holds the Golden Cockerel, and by him stand the old man and the old woman from the story about the fisherman who caught a magic fish that granted his wishes (until he overdid things at his wife's instigation).

There is Ostap Bender, the amiable wanderer from *The Twelve Chairs* and *Little Golden Calf* by Ilf and Petrov.

Now Pavel plans to do a whole gallery of wooden figures of children's favourite characters — Gulliver, Paganel, Tom Sawyer and the modern heroes of an author particularly beloved by Soviet children, Arkadi Gaidar.

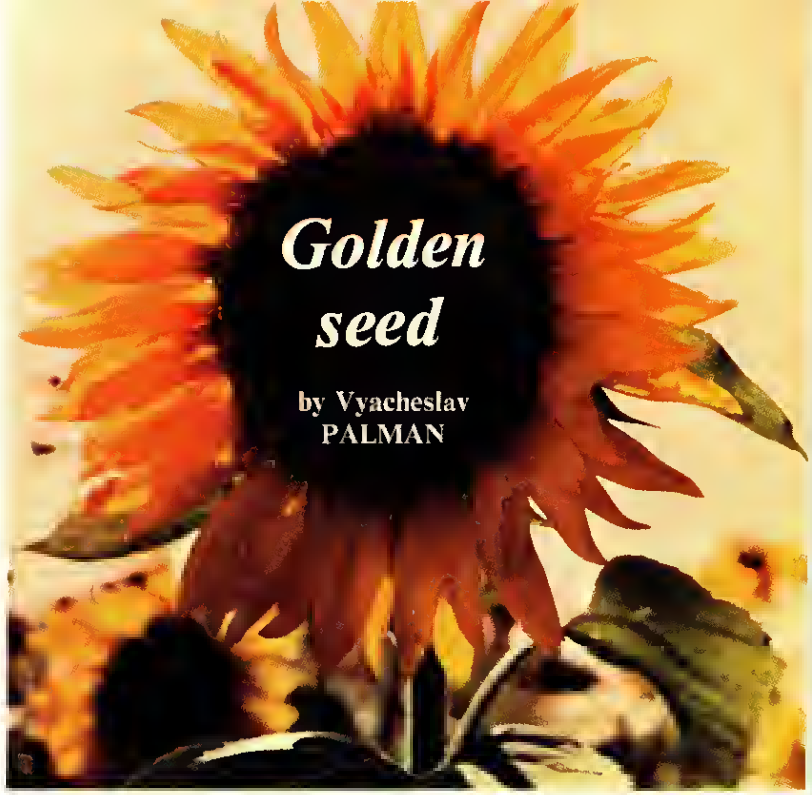
For adults he intends to carve the bizarre creatures in Gogol's *Dead Souls*.

What about his basic work? This promising young artist has set his sights on entering the Arts and Crafts College to develop his skill as a sculptor and perhaps learn more about painting.

Inspector Maigret.

Charlie Chaplin

Opposite: D'Artagnan and the Three Musketeers. Characters from Pushkin's "Golden Cockerel", Ostap Bender (left) and his companions.



Golden seed

by Vyacheslav PALMAN

from the newspaper SOVIETSKAYA ROSSIYA

Four and a half centuries ago, the caravels of Christopher Columbus brought back to Spain from the New World a gift without a name—a plant with golden flowerlets and tasty seeds.

In his frantic search for gold to present to the Spanish court, Columbus had no inkling that this golden flower—which we call the sunflower—would ultimately become more valuable than the chests of gold he laid at the feet of Queen Isabella.

It was about 1504 that the citizens of Madrid first saw the small, longish seeds of this decorative perennial. And it was Karl Linnaeus who combined two Greek words—helios (sun) and anthos (flower)—to give it its botanical name of helianthus.

The destinies of some plants are as exciting as some human destinies, perhaps more so.

The sunflower was planted in Madrid's botanical gardens, and took root. Later it was taken to France, Italy and the Balkans. It was valued for its beauty as well as for its seeds, which yielded an edible, and palatable, oil.

Early in the nineteenth century, the sunflower found its way to Russia. It was first sown in vegetable gardens for its seeds, to which Russian peasants had taken a liking. When they discovered that the seeds contained valuable oil, the sunflower spread over vast areas.

Before the First World War Russia produced about 100,000 tons of sunflower-seed oil, almost equal to her aggregate annual output of all other plant oils. The yield was approximately 90 pounds of oil per acre.

Crop farmers and seed experts in southern Russia, the Volga region and the Ukraine, after multiple selection of the best plants, developed several new varieties with yields up to 900 pounds of seeds and from 190 to 280 pounds of oil per acre.

Boris Yenken, an agronomist, had cultivated sunflowers at Kharkov, in the Ukraine, since 1910. In that year Yevgenia Plachek launched a similar project at Saratov on the Volga, and Vassili Pustovoit at Yekaterinodar (now Krasnodar) in the North Caucasus. A little later Leonid Zhdanov began to grow sunflowers near Rostov-on-Don.

A series of experiments was carried out around Voronezh (central Russia) and Omsk (central Siberia). After 1917, planned sunflower research was extended on experimental farms.

Two varieties of sunflowers in the collection of the Soviet Union's Oil-Bearing Plant Institute—the wild American one and the Soviet-developed—reveal less affinity than the most distant of relatives. One resembles a dwarf, with a thin branchy stalk and a multitude of small heads containing tiny grey seeds.

The other is a big-leafed plant about five feet tall, with one big head tightly packed with from 1,500 to 2,000 dark seeds.

There certainly is a big difference. The achievements of Russian seed experts have made it possible for the most able of them—Vassili Pustovoit, now a Member of the USSR Academy of Sciences—to obtain a completely new variety of the plant. Its seeds have a high oil content. It yields rich crops, is hardy, profitable economically, and can be sown on vast areas.

In 1967 the Soviet Union had 10.5 million acres sown to sunflowers and the average yield was more than half a ton per acre. Around the River Kuban (in the North Caucasus) sunflowers yield over 0.8 ton per acre, while some farms have brought the figure to more than one and a half tons per acre.

The early Russian varieties, the basis for initial selection, had an oil content of from 24 to 32 per cent. Dr Pustovoit's latest varieties contain from 52 to 55 per cent. The oil yield has almost doubled.

★ ★ ★

POSTSCRIPT. In a Soviet government office lies a neat pile of letters and cables in many languages—English, French, Italian, Korean, Arabic and many others. Each contains a request for seeds of Russian sunflowers.

Ironically, one of the letters has the crown of Spain on top.

SOCIAL OPTIMISM V. SOCIAL PESSIMISM

"Can anything be more powerful than reason? It alone has the vigour and strength to rule the Universe."—Konstantin Tsiolkovsky

Forecasts of the future are the traditional stamping-ground of the science fiction writer. But scientific logic would set limits to his imagination, and the very name science *fiction* writer absolves him from responsibility for the accuracy of his prophecies.

In our times, scientists have been turning to the business of forecasting the future with increasing frequency. Their ideas of the future, while containing an element of fantasy, are strictly scientific. Viewing all the achievements of civilization as a whole, they are able to isolate the basic trends in the development of society and to measure the potentialities and requirements of mankind, anticipating difficulties and suggesting ways of solving them.

The following exercise in social forecasting was written by an astrophysicist.

A scientist looks into the future

by Dr. Iosif SHKLOVSKY,
Corresponding Member of the USSR Academy of Sciences

from the book
The Universe, Life and Reason

Early in the nineteenth century a British clergyman, Thomas R. Malthus, propounded a theory in which he claimed that the earth's population increased in geometrical progression (1 : 2 : 4 : 8 : 16 : 32 etc.). Therefore, he said, the progressive impoverishment of mankind was inevitable, and hunger, disease and war, which cut down population, were really blessings in disguise.

Malthus estimated that by 1950 the population of England (having doubled every 25 years) would number 704 million. At the same time, he believed that the country could support only 77 million. In

fact, Britain's population in 1950 had grown to a mere 51 million and people were eating better, on average, than their 11 million forebears 150 years earlier.

Of course, man lives not "by bread alone". Many factors are involved in our concept of a standard of living. How can they be summed up?

One criterion is the development of the power industry. Power, after all, helps to produce food, clothing and shelter, provides light and heat and, finally, gives man some control over the rampaging elements.

Since the late eighteenth century, the overall world output of hydroelectric power has been growing faster than the world population. In other words, a certain averaged "index of well-being", contrary to Malthus' prophecies, has been rising steadily.

The question is, will it continue to rise?

The world population is increasing, on average, by two per cent annually. According to United Nations figures, the world will double its present population by the year 2000, to top the six thousand million mark (largely due to population growth in developing countries, in which the average annual increase is three per cent or more).

Rates of growth depend on social, rather than biological, causes. As the economy and culture advance, the birthrate falls *(for details see Sputnik for April, 1968).*

Having overcome the present social crises, mankind will be able, as Engels put it, to regulate the "production of people". The society of the future—a society of reason—will find that its material well-being rises faster than its population.

A question follows: Will the limited nature of the world's material resources put a stop to the constant growth of productive forces and, consequently, the raising of living standards?

For two centuries the annual world production of power has been doubling roughly every two decades, until today it would require close to two thousand million tons of anthracite to produce the equivalent energy. At the present rate, in 200 years the output of power will be one thousand times its present-day figure.

Reserves of coal, oil and natural gas, however, may run out long before that. In some areas they may be exhausted within 15 to 20 years.

True, nuclear fuel will come to the assistance of electrical energy. It is already coming into use, with nuclei of uranium and other heavy elements undergoing fission in the reactors of atomic power stations.

Let us be optimistic and assume that the involved problem of controlled thermonuclear reaction will be solved by synthesis of light elements, such as hydrogen and its isotopes. That would open a way to obtain energy from ordinary water, of which the earth has whole oceans, but . . . there is a limit to how much the aggregate capacity of nuclear reactors can grow. The earth's surface and atmosphere can become overheated, and this is fraught with latent dangers to our planet.

Some foreign writers assume that man will have to stabilise the power industry at a certain level, and strictly forbid further development. But I do not think this is realistic.

To put the question in another way: Why assume that man's progress has to depend on the continual expansion of productive forces? Perhaps qualitative changes will enter the picture?

Not being a philosopher, I can offer no exhaustive analysis of the problem. But I venture to think that any society whose productive forces do not improve in quantity or quality is doomed.

In deliberately stemming the expansion of its production potential, a society would be courting disaster. A tiny drop in the rate of advance could eventually upset its economic balance and, over several millennia, a consistent under-reaching by even a fraction of one per cent would lead to an almost complete halt to the world's technological advance.

Now let us assume that the output of power and material goods will rise by only one-third of one per cent annually (in which case population growth must be slower). Even such a snail's pace of advance would double the volume of production in a century, send it up 20,000 times in 1,000 years and 10,000 million times in 2,500 years!

The output per second of energy should reach formidable proportions, rising to 100,000 times the amount of solar heat and light reaching the earth per second.

Leaving aside the question of overheating the atmosphere, let us estimate whether the oceans, with their apparently inexhaustible resources of hydrogen, will suffice to provide that much power.

If all the deuterium contained in the earth's water is burned in thermonuclear reactors, the amount of energy released (the power industry keeping to the snail's pace of advance, one-third of one per cent annually) will meet the world's requirements for a maximum of 2,550 years.

Even if mankind has by then learned to use ordinary hydrogen, and not only the heavy variety, in synthesis reactions, the complete "burning" of the world's oceans would release enough energy to last only an additional thousand or so years.

As for solar radiation, even if people utilised it in full, it would cover only 1/100,000th. of the world's power requirements in the 45th. century.

It follows that the earth's power and material resources are too meagre to last the human race for the next few millennia, even if the rate of the world's technological progress is very slow.

But undoubtedly human progress will shorten the time span. Is there a way out?

In 1895 the Russian scientist Konstantin Tsiolkovsky, the man who produced the first modern-type space rocket designs, published his *Meditations About the Earth and the Sky.* He pointed out that the situation in which the earth gets only a two-thousand-millionth of the overall amount of solar energy was absurd.

This pioneer theoretician of space

travel believed that the people of the earth were destined to master "all solar heat and light". Mankind, he thought, would sooner or later settle in outer space and there find enough energy, material resources and living space.

The scientist saw the "colonisation" of the solar system as a step-by-step process. The first stage, he said, would be the mastering of asteroids (the minor planets, an agglomeration of which forms a whole belt between the orbits of Mars and Jupiter).

In his *Meditations*, intelligent beings control the movement of asteroids the way riders control the movement of horses. Human beings obtain power from "solar engines"—70 years ago, when people knew nothing about semiconductor power converters, Tsiolkovsky anticipated the development of solar batteries, which now feed the on-board instruments of sputniks and interplanetary stations.

The man-transformed asteroid belt would, according to Tsiolkovsky, become a "chain of ethereal cities". The substance of some of the minor planets, "taken apart completely", would make excellent building material. From it, artificial space bodies would be formed in the shapes their "sculptors" saw fit.

When these resources come to an end, human beings, said the scientist, would be able to exploit the moon, a process which he thought might continue for several centuries.

The transformation of space around the sun, he predicted, would take millions of years. Thus transfigured, the universe would provide all the necessities for million upon million times as many human beings as comprise the world population today.

Earlier in this century Tsiolkovsky's *Meditations* seemed as substantial as moonbeams on the water and were taken for the eccentricities of a provincial schoolmaster. But times change. Soviet astronaut Alexei Leonov and his American counterpart Edward White recently proved that man can work in airless outer space—an experiment that has brought closer the materialisation of the dreams of Leonov's eminent compatriot.

In 1960 the points made in *Meditations* were echoed by a noted American astrophysicist, Dr. Freeman Dyson. Dr. Dyson's work is based on the spectacular achievements of science today, while Tsiolkovsky's forecasts had no such firm basis at all. It is interesting that, half a century before the beginning of the space age, he envisaged mankind's need to expand into the universe.

Dr. Dyson assumes that in the next two or three millennia, human beings, in a bid to utilise as much solar energy as they can, will encase their "mother star" in a giant hollow sphere that will have a radius of 93 million miles and a wall several yards thick. To build it, the scientist envisages, they will use the substance of Jupiter, which will be taken apart and processed by their engineers. The earth and some other planets will move in their orbits as if under a hood.

The inner surface of such a "covering", a thousand million times as large as that of the earth, will become a human habitat, with homes, industrial

and farm buildings complete with machinery on it. Its population could very well reach the grandeur predicted by Tsiolkovsky.

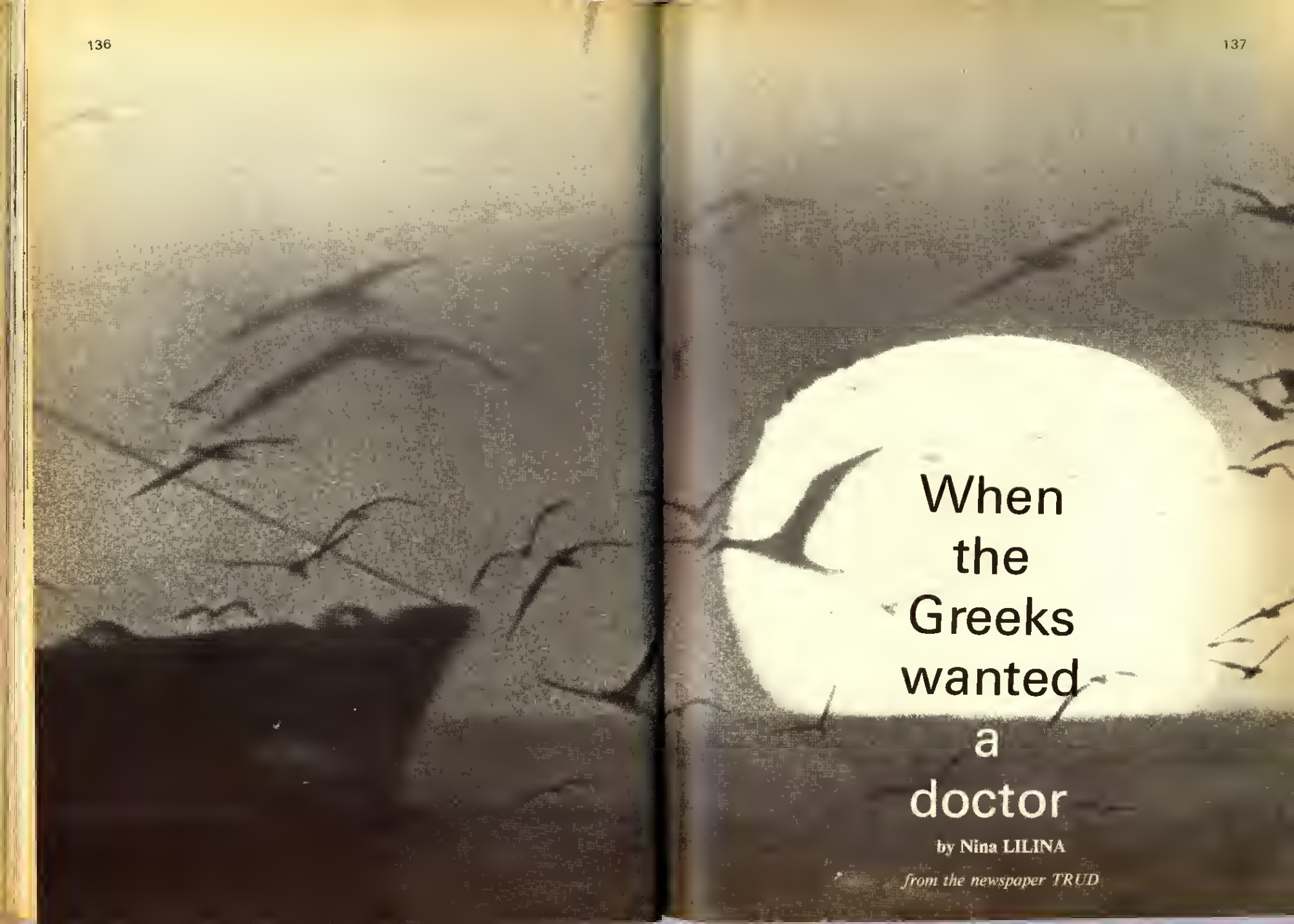
Nearly all solar energy will be harnessed and made to serve man. In the opinion of Dr. Dyson, not only the human race, but any other thinking species within several millennia, after it has entered the stage of technological advance, will occupy the artificial biosphere which will englobe its "mother star".

There are other possibilities open to a civilization intent on exploiting the power resources of its planetary system to the full. An alternative to the exciting project advanced by Dr. Dyson is the burning of celestial bodies.

Jupiter and other major planets consist mostly of hydrogen. Jupiter alone has enough nuclear fuel to last mankind 300 million years, even if it gives it off at the rate of solar radiation.

Finally, why not imagine a highly-organised civilization reconstructing the star near which it has arisen by, say, using this star as the source of thermonuclear fuel? A few hundredths of the sun's mass is tens of times as much as the whole mass of Jupiter, a giant planet! The fuel thus obtained would last thousands of millions of years.

In any case, the mastering of space, which has been effectively started by the Soviet Union and the United States and is now being taken up by other nations, will solve many of the cardinal issues raised by contemporary Malthusian "prophets of doom".



When the Greeks wanted a doctor

by Nina LILINA

from the newspaper TRUD

NOBODY must harm a sea-gull. Sailors hold these birds in great reverence, and some even say that the souls of those lost at sea live on in the bodies of the birds, which are as dazzling white as the lacy surf.

That day the sea was calm, and the boys of Novorossiisk, the Black Sea port, were sitting on the embankment steps. The greenish water lapped lazily at their feet and they were feeding the gulls. Ragged pieces of bread floated on the water like soft March snowflakes.

Where was the sea-gull which, according to the old sailors' belief, should have been waiting for the soul of Ioannis Malonas, as he lay with throat and wrists slashed in the crew's quarters of the Greek ship *Theotokas,* then sailing the Indian Ocean? And why had the young and healthy Malonas decided to commit suicide? Was it love? Politics, perhaps?

His fellow sailors watched helplessly as he lay silently bleeding to death. There was no ship's doctor. The radio operator sent out frantic messages, and minutes turned to hours.

Then tbe *Theotokas* ran into a gale. The usually cool and calm captain was desperate. Malonas was doomed to die, and when they got back to Greece he himself would be tried and probably lose bis master's ticket.

"There's an answer from a Russian ship," the radio man shouted. "Captain, the Russians are on the air!"

The captain did not believe in miracles. So what if a Soviet ship had answered their SOS? It was probably true that Soviet vessels always had a doctor aboard. But now it was too late. In such a storm it would be impossible to lower a boat.

"Ask them for their advice," he ordered, aware that no advice was going to save Malonas, but only the living hand of a doctor. That became pitifully clear as the radio operator talked with the Soviet ship and Malonas got worse and worse.

"Ask them to send a doctor," he said finally, in frozen tones.

* * *

Aboard the Soviet tanker *General Zhdanov,* the captain rose as the doctor entered his cabin.

Briefly explaining the situation, he added, "Bear in mind that in a gale like this you have the right to refuse."

"As a doctor I have no such right."

"Furthermore, the Greeks say it's a suicide case."

"I'm a doctor, not a sociologist."

Tbe operator aboard the *Theotokas* picked up the message: "We're coming nearer."

The two ships were 220 miles apart. When the distance was narrowed to half a mile, the tanker lowered a boat into the 15ft. waves. It looked as though it would be dashed to pieces, but each time it hung precariously for a second on the crest of a wave and then glided into the abyss without mishap.

It was two hours before the boat made fast alongside the *Theotokas,* amidst the giant waves lashing against the ship's steel sides. Between the mighty impacts the doctor had to be hauled aboard by cable. The opportunity came, and before the astonished Greeks stood a bedraggled barefoot figure, soaked to the skin, in a torn white coat.

It was a woman.

Yes, Malonas was very badly injured. The storm continued to rage, and the cabin-cum-operating theatre shuddered as the waves thundered against the ship's sides. At last, after three hours, a weary voice said, "He'll live."

The Russian boat put to sea again. The farewell lights of the *Theotokas* disappeared into the gloom of the storm, and they could see the tanker ahead. The ocean still meant business, and there was a danger that the boat would be smashed as it was being hauled back on to the *General Zhdanov;* that the doctor and the crew would be lost. It was another four and a half hours before she and the sailors felt the firm deck of the tanker beneath their feet.

Late that evening, Raissa Lomazova, ship's doctor, lay in her hammock, utterly worn out. Tears trickled down her cheeks from nervous exhaustion, and from fear of what might have been.

To hell with all these adventures at sea, she thought to herself. She was just a weak woman, and she wanted to get home to Novorossiisk as fast as she could.

But that would not be very fast. On the way were India, Japan, the Far East . . . Before they put in at an Indian port she must check the medical supplies. The local people waited impatiently for Soviet ships precisely because of their doctors. The Russian doctor would hand out medicines and give them professional advice.

On the last voyage the Japanese authorities had been very fussy when they inspected the hold, looking for some kind of beetle. If they found one, it would mean fumigation, a costly business. She had better go down and take a look in the hold, to see for herself if there were any there this time.

Immersed in thoughts of her everyday chores, she calmed down and dropped off to sleep.

* * *

"For courage and valour displayed in the saving of life," the message of appreciation ran, "to Raissa Lomazova, ship's doctor, first mate Kuznetsov, fourth mate Demidenko, radio operators Potiridi and Melnichuk, engineer Sokolov, and seamen Rudakov, Pugachev, Kononov and Sibilev. . ."

She would never forget any of those lads as long as she lived. Before that day in the Indian Ocean she had never really understood the meaning of comradeship at sea.

The ocean had held them in its hand for seven hours or so. If it had hit out just a little harder, that would have been the end of them all. Their spirits would have flown home with the sea-gulls to Novorossiisk.

Russia's Digest 150 years old

by Yuri FEDOSYUK

Digest, noun: Periodical synopsis of current literature

Digest, verb: Get mental nourishment from.

—Popular dictionary

Sputnik's remote ancestor, and the grandfather of all Russian digest magazines, was born in St. Petersburg a century and a half ago, in the year of the Battle of Waterloo.

Titles were longer in those days. The pilot issue, off the press in January 1815, was called *Quintessence of Magazines,* with a subtitle, "A collection of all that is best and curious in all other magazines relating to the fields of history, politics, government economics, literature, various arts, rural domestic science, etc."

Quite a mouthful. And the editor was long-winded, too. His initial *Quintessence* editorial assured the reader that ". . . like a honeybee that extracts fragrant juices from a thousand blossoms, which thereby lose none of their freshness nor beauty, our magazine will extract from all the blossoms of literature their strength and, so to speak, their soul".

More laconically and matter-of-factly, almost in the style of today, the editorial continued, "The magazine will present a panorama of the best periodicals."

Quintessence was printed on rough-textured paper and bound in heavy blue "sugar-bag" paper. The magazine was small and thin and had no illustrations of any kind—they were too expensive. Today its yellowing pages look unattractive, but there must have been a time when subscribers eagerly looked forward to the latest copy and impatiently slit open the pages. After all, there was so much in it that was new and surprising and educational.

Let us examine some of the contents and find out what the early nineteenth century has to say to the readers of the space age.

In the first issue the publisher and editor, Grigori Yatsenkov, informs his readers tbat the idea for his unusual publication came to him from the following source.

It seems that a well-known Russian eighteenth-century comedy-writer Denis Fonvizin, was visiting Prince Potyomkin one day. The Prince complained of the inordinate amount of time wasted on wading through periodicals in search of information or news which interested him.

Fonvizin advised him to put two or three scholars to work reading all the periodicals of the day, and they could draw his attention to those articles or sections which were worth reading.

"Not everyone has the opportunities of Prince Potyomkin," the editor rightly pointed out, "but perhaps many would like to enjoy the convenience of reading only whatever is best and most intriguing in all magazines without effort, inordinate expense, or boredom. The publishers undertake to offer the worthy public the same service as Prince Potyomkin's scholars performed for him."

Grigori Yatsenkov, the publisher and editor of Russia's first digest magazine, was little known in his own time and today has been entirely forgotten. He was a translator from French and German and, besides publishing *Quintessence,* produced for some time a very dull *Journal of Manufacture and Commerce.*

The turbulence of those years (1815-20) when the digest came out left its mark on the magazine. It highlighted the struggles of the time, the Hundred Days of Napoleon, Waterloo, the Congress of Vienna and post-war reconstruction of Europe. It reflected tbe alarums, disillusionments and vain hopes of mankind for eternal peace.

"Kings and peoples are embracing like brothers and the dawn of future bliss is breaking on the horizon of Europe," the magazine announced shortly after the defeat of Napoleon.

But with the Holy Alliance playing a mounting role in Europe, the magazine also sounded a note of prudence and restraint—a consequence of the growing political reaction.

Pro-Napoleon, anti-Slavery

Nonetheless, Russia's first digest remained true to its initial direction and on the whole was a progressive periodical. Its servility to the victorious monarchs did not completely hide its Napoleonic sympathies. It expressed disagreement with a reactionary Hamburg magazine which called for the destruction of Paris as the cradle of the French Revolution.

It printed an indignant comment on the shameful slave trade in African Negroes and praised industrial progress, industrial revolution and advances in world trade as guarantees of mankind's happiness.

The world, in those days still largely unexplored and lacking rapid means of communication, seemed more spacious.

Some statistics of 1810 appear unbelievable today: the population of

Britain was a little over 15 million, that of Russia 43.5 million, France 29.3 million and the United States 10.4 million.

The need for international trade and the urge for market expansion and exchange of industrial experience made travel notes a favourite.

Around the world

Quintessence was fond of running "Travellers' Letters" from various European countries and America, China and Persia. The "Letters" often contained a wealth of information about countries which took a traveller days and sometimes weeks of hard travelling to reach.

Based on the assumption that the reader was quite ignorant of the country in question, the writing is sometimes painfully detailed and tedious. Much space is devoted to facts and figures and not enough, from the contemporary viewpoint, to personal observation.

Nonetheless, some interesting insights emerge. Thus in 1814 a Russian traveller in England was struck by the industrial upsurge.

"Steam engines are the idol of the English," he wrote. "In London there are more than 1,000 of them." True enough, "the English are reluctant to show foreigners their manufacturing plants, fearing imitations."

He watched the construction of Vauxhall Bridge across the Thames, and pointed out that gas-lighting was common "not only in the streets and public buildings, but also in private homes and shops".

A Russian visitor to Vienna described everyday life. From him we learn that "the Viennese are great lovers of wine. At ordinary parties guests are faced with two, three and even four bottles of wine each". And woe betide those who cannot polish them off, he continues. Such are considered half-men.

"At such affairs I always fell into the category of half-men, but gave my word that when next I returned to Vienna I would fully belong to the male sex . . ."

A writer on "Morals, Customs, Way of Life and Character of North Americans" says, "There is no distinction of rank or title here. Wealth alone gives a stable and unchanging place in society; perhaps the desire for wealth is stronger here than in any other country."

On women: "American women are courteous but simple-mannered, intelligent and never boring; in all respects they are model wives, daughters and mothers."

On reading: "Magazines are more widely read here than any books. The people, I should say, read next to nothing besides magazines and newspapers."

The publishers of *Quintessence* were interested not only in foreign lands, but also in the great expanses of Russia. Now and then they ran articles on Russia as seen through the eyes of foreigners. One such was entitled "Letters of a French Army Officer from Russia while a Prisoner-of-War in 1813 and 1814." A passage read:—

"In the past 15 years the Russians have made great strides in manufacturing: they skilfully weave cloths and make various cotton and even silk materials. The Imperial Glassworks produces mirrors of a size not made anywhere else in Europe. Glass-cutting has been brought to perfection. They polish mirrors and cut glass with the aid of a most devious steam engine that actuates a thousand wheels."

The value of Siberia

But more often Russians wrote about Russia. "Excerpts from Writings on Siberia" said, "Since its acquisition, through the flow of its treasures, Siberia has influenced and will continue to influence both domestic and foreign trade."

The author agitates for the all-round development of Siberia's industrial potential. "The rare gifts which nature has bestowed upon this land, its wealth, in which all the kingdoms of nature are represented", called for exploitation.

The economic boom of that "most spacious land of Siberia" today arouses interest in all parts of the world.

A certain Russian traveller (alas, *Quintessence*, like its source magazines, usually avoided naming the author) gave his impressions of Bologna and its university.

"As I approached an auditorium I saw a notice on the door: Greek Literature. 'Who is the professor?' I asked Signor Fortis. 'Go in and you will see,' he replied, and we entered the hall. Over 200 students were sitting on benches. But can you imagine my surprise at seeing on the professor's rostrum—a woman! I have often met learned women in my own country, but never before had I seen a professional woman scholar, a Mme. Professor!"

Next comes a description of this amazing specimen of humanity: "Signora Tambroni is a woman of about 35, tall and with a Grecian profile. She has all the attractions of her sex and could in her youth have served as a model for the statue of Faustine."

But the traveller's amazement knew no bounds when, at a reception Signora Tambroni gave that evening, he met yet another learned woman, a professor of medicine at the same university. "Literature, even Greek," comments the Russian, "can somehow be associated with the fair sex. But medicine? That seemed incongruous to me."

He experienced moments which to this day bemuse Russians abroad moving in educated circles. "The Italians have a very vague idea of Russia, almost as vague as their understanding of Garibaldi." His hosts refused to believe, he writes, "that I was educated in Russia, but were convinced that I was raised at least in Germany."

Such conversations dimmed the admiration he had originally felt for West European progress on meeting the lady-professors. Today his descendants listen without any surprise to lady-professors. But how

astounded the unknown author would have been if he had been told that 150 years later 6,000 women in his own country would possess scientific degrees.

The intense thawing of Arctic ice in 1816 encouraged some explorers to think they could come within striking distance of the North Pole by sea. Three years later the Britisb Government outfitted an expedition under Lt. William E. Parry (who in 1818 had explored Lancaster Sound).

In 1820 Parry passed 110° W. and wintered on Melville Island. That expedition, though it failed to reach the Pole, has gone down in the annals of Arctic exploration.

But few people know that in Russia an idea developed to help the British in their gallant undertaking. Someone suggested that the expedition should sail to Spitzbergen and from there proceed by dog-sled to the Pole.

To find out if the idea was feasible, Russian authorities interviewed Archangel hunters and fishermen who frequently wintered on the bleak, then uninhabited coast of Spitzbergen. An interesting interview with these people was carried by *Quintessence.*

After a series of questions about conditions of life in Spitzbergen, the hunters were asked if it was possible to reach the North Pole by travelling on ice in winter. "We bave never tried," tbey replied, "and think it impossible. The reason is a multitude of extremely tall mountains of ice; besides, in many places gulfs, whicb do not freeze over completely and where ice-floes float all the year round, would make the crossing impossible."

The hunters rejected a plan submitted for their judgment, which called for the setting up on the ice route of three intermediate bases in which the "brave fellows would find sbelter and food." They said, "It seems quite impossible to us. There is no way of transporting logs to build cabins, or to take firewood and food across such a long distance."

The plan was clearly not feasible. However, it was remarkable as an attempt at Russian-British co-operation in conquering the Arctic (Russian hunters were to have guided the expedition).

In succeeding decades many expeditions came to grief, and the Notth Pole was not reached until 1909, when Robert E. Peary made his successful dash from Cape Columbia, Ellesmere Island. Nobody has ever got to the Pole on ice by the proposed route from Spitzbergen (tbough in 1926 Amundsen, Ellswotth and Nobile flew from Spitzbergen over the Notth Pole to Teller, Alaska, in tbe airship *Norge).*

Green roses and air-mattresses

Quintessence, under the heading "Miscellaneous," printed news of novelties and curiosities. Many of its items have long ceased to be surprising. Otbers remain unbelievable, or at best questionable, to this day.

The magazine suggested methods of cultivating black, yellow and green roses, preventing milk from turning sour by adding horseradish water, and even feeding horses nutritional globules instead of hay and oats.

Some statistician, on the basis of data relating to mental hospitals in Hamburg and Britain, deduced that most mental cases were brunettes, fair-haired patients being exceptions.

Item: Six Scottish families, persecuted at home for their faith, settled on Mt. Besbtau, in the Notth Caucasus. The settlers took up farming and set up a printshop.

Item: A certain Mr. Clarke of Bridgwater invented "air-beds"; from the description we would call them air-cushions and air-mattresses. The magazine predicted a great future for the invention.

Another item raised a subject pertinent in our time. It could have been published today if not for some exaggerations. Entitled "Tame Dolphin", the story reads:—

"An Englishman in Britain has domesticated a dolphin (sea dog). Tame as a mongrel, it eats out of its master's hand and always keeps by his side. When its master goes fishing, the dolphin swims around his boat and tries to get back in—showing that its attachment to the man is stronger than its natural inclination to swim in the water."

There are no grounds for leafing through *Quintessence* with a condescending smile. Far from being a conservative publication for its time, the magazine took up and advocated all that was new and progressive, notably in the fields of technology, trade and culture.

Many of the problems it raised are featured in magazines to this day.

One, for instance, is discussed in "Investigation into the Harmful Effects of Strong Beverages, Collected by a Man Who Drinks Nothing But Water."

Another warning article advocated, as early as 1820, forest conservation. Although it must be added that the author believed Russia's forests were thinning because of naval construction and the building of *izbas* (log cabins).

Still another curious item, "About the Annual Increment of Gold and Silver in Europe," states that huge amounts of precious metals were coming to the Old World from America.

A belated tribute

Sputnik's predecessor existed for about six years only and ceased publication late in 1820 for undiscovered reasons—possibly as a result of intrigues of rival magazines.

Without exaggeration, the magazine was a remarkable phenomenon in the history of Russian journalism. Even at the statt of the nineteenth century—only 100 years after the emergence of Russian journalism under Peter the Great—tbe superabundance of magazine information required a digest.

Sputnik has every right to be proud of its forgotten predecessor, which performed its noble mission by extracting "the fragrant juices from the thousand blossoms" of periodicals to satisfy the thirst for knowledge in thousands of readers.

* NURSERY SCHOOL— WHAT'S IN IT FOR THE CHILD?

from the magazine GORODSKOYE KHOZYAISTVO MOSKVY (Moscow Municipal Affairs)

Each morning about 400,000 Moscow children between the ages of two and seven set off for their nursery schools. The city has 3,500 of them, each with its own teaching, medical and domestic staff. Children can spend all day there until their parents collect them after work, and are provided with meals from breakfast onwards. Most of the cost is borne by the State, parents contributing 8 to 12 roubles a month according to income. Here YELENA PROSVETOVA, Moscow's Deputy Mayor, answers some questions about the city's nursery schools.

It is generally recognised that children starting school are far more advanced and have a far broader outlook than was the case ten years or so ago. Can this be put down to the present level of nursery school education?

To a considerahle degree it can. About 70 per cent of the children starting school in Moscow now come from nursery schools.

From the very first day school makes demands on children, hut experience of nursery school, combined with parental influence, ensures that a child is willing and ahle to learn.

While at nursery school his powers of concentration develop, together with an ability to reason logically, a love for hooks and an interest in going to school. He learns to live in a group of children and gets used to ahiding hy certain rules of behaviour.

In the past few years nursery schools have hegun to teach senior groups—five- and six-year-olds—the elements of reading.

Until recently there was a shortage of nursery school teachers. What is the position today?

We now have teachers in sufficient numhers. In Moscow there are five nursery teacher-training schools.

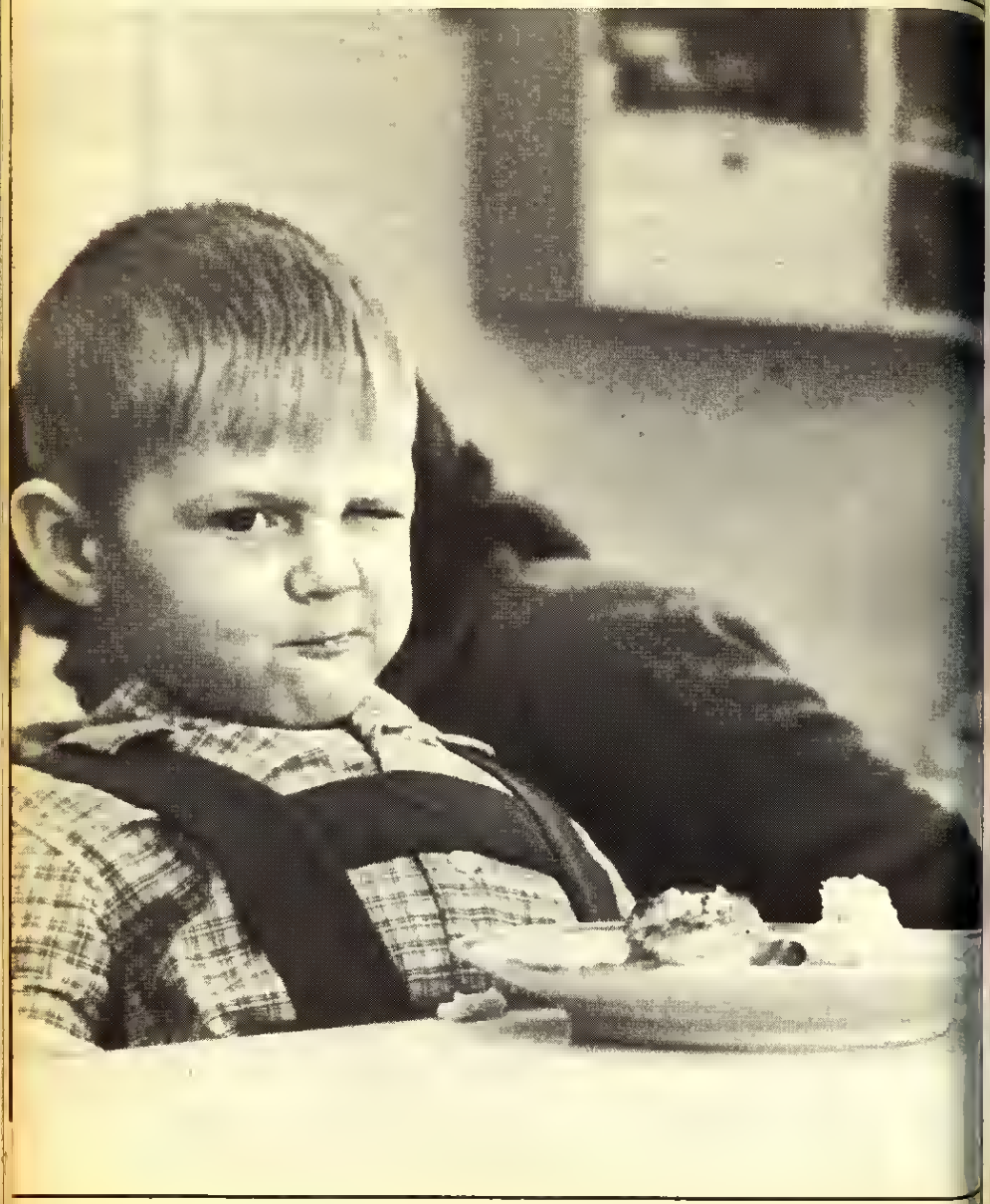
Now it is important to raise standards. A methods group set up by the municipal education department is doing a great deal of work in this sphere.

It has sections which specialise in sport, play, literature, nature study and other suhjects. It organises advanced courses and seminars for nursery school teachers, and its staff is always available for consultation.

Childhood impressions leave a profound imprint on a person's life, and the nursery school teacher has to make sure that those early impressions are as helpful and happy as possible.

Preparation for school is not, presumably, the basic task of the nursery school. What do you see as the main thing in its activity?

Forming the child's character. For this reason, moral and aesthetic training occupy an important place in the teacher's work.



We want each of our children to be self-exacting, modest and willing to work. I am not going to pretend that they always are, but it is something we must make great efforts to bring about. Confidence in children and respect for the child's developing personality has put many teachers on the road to success.

Nursery schools are maintained largely by the state. Is the money allocated by the state enough to provide places for all children whose parents may want to send them to nursery school?

The demand for nursery school places is almost fully met now. The only difficulties are in a few of Moscow's newer districts, where construction work is not yet completed.

As regards the sums allocated by the state, these are increasing all the time. In 1967 we were able to build nursery schools with 60,000 places.

Standards of buildings are improving all the time, and also of furniture and equipment. Some nursery schools have their own pools, skating rinks and sports grounds.

With the Knorozov system, unknown hieroglyphs can now be decoded by electronic computer.

CRACKING THE ANCIENT MAYAN 'CODE'

by Vladimir KUZMISHCHEV

condensed from NAUKA I ZHIZN (Science and Life)

In 1562, in the town of Mani, Yucatan (Mexico), a Roman Catholic monk named Diego de Landa destroyed thousands of manuscripts left by the ancient Mayans—relics of one of the world's most interesting civilizations, and one that in many respects surpassed those of the Incas and Aztecs. One of the pre-Columbian civilizations of Central America, it developed a form of writing back in the fourth century A.D., despite the fact that it was still a Stone Age

society. In his *Relacion de las cosas de Yucatan,* de Landa related what he had learned about the Mayans and their written language. For some 300 years his *Relacion* was kept among the records of the Inquisition until, at the close of the nineteenth century, it fell into the hands of scholars. Experts, in all countries, on the languages of the New World tried in vain to decipher the three surviving Maya manuscripts and gave up, convinced that the language would remain a mystery for all time. But the mystery was finally solved by Soviet scholar Yuri Knorozov.

EXPERTS believed that every symbol in the Mayan language was a whole word or notion. In other words, each symbol had a complete and definite meaning. But they could not find the key to that meaning, and wrote off tbe language as an eternal enigma.

Knorozov, however, went on the assumption that the Maya symbols *had no intrinsic meaning.*

The guess of a genius seems so painfully obvious and simple that it appears strange that it occurs only to a genius. As Edison said, "Genius is one per cent inspiration and 99 per cent perspiration". Knorozov's assumptions illustrated this.

He assumed that the Mayan hieroglyphs, like letters or syllables in European languages, represented merely sounds and not words. From this it followed that the hieroglyphs could be similar to letters, and if there were letters there must be an alphabet. Knorozov set out to discover wbat that alphabet was.

Anyone well acquainted with the subject might object that de Landa had already produced an alphabet in his *Relacion,* as was made clear in the translation made of his work by Brasseur de Bourbourg a century ago. But attempts to use this alphbabet had led to nothing. Scholars decided tbat it was either incorrect or contained only a small proportion of the symbols.

As the alpbabet remained an unsolved problem, de Landa's three examples of word formation in Mayan symbols were unintelligible. For instance, according to the examples, a word that had the sound of "LÉ" (loop) had been written "ELÉELÉ". That looked so absurd that nobody even tried to explain what the monk could have meant.

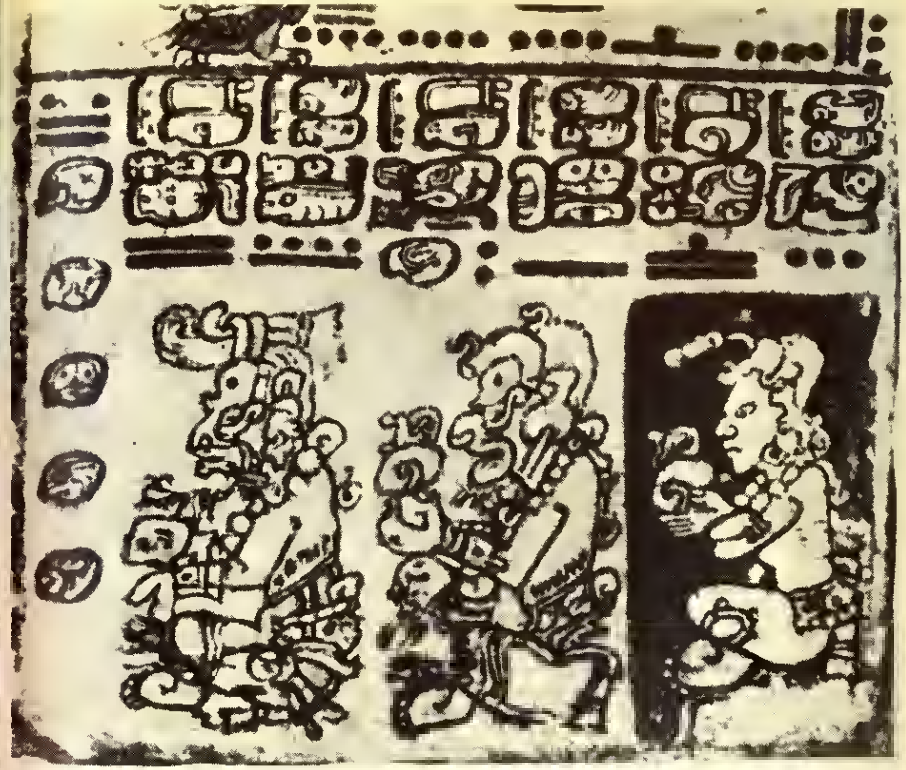
Knorozov decided to start off by translating the *Relacion,* which had been written in Old Spanish, into Russian. He had as little confidence in de Landa as his predecessors had, but one tbought nagged at him: why did the Spaniard, whose information was otherwise so accurate, get his alphabet in such a muddle? Perhaps his Indian informant had deliberately deceived him?

In compiling the alphabet, de Landa had proceeded on the basis of his own language, Spanish, and accordingly, when he recorded the Mayan hieroglyphs, he stripped them of their semantic and phonetic meaning. To him, the symbol represented merely the name of a letter in the Spanish alphabet.

On top of each symbol, he wrote the corresponding Spanish letter and arranged the symbols in Spanish alphabetical order.

Knorozov's predecessors had been aware of all this. But when they had tried to "read" the Mayan symbols by substituting Spanisb letters for them, nothing had come of it. Attempts to use de Landa's alphabet had to be abandoned.

Knorozov had a magnificent



Mayan manuscripts like this one have for a long time puzzled scholars the world over.

brainwave: suppose de Landa had selected the characters and syllabic symbols in accordance with the *names* of tbe Spanish letters and not their pronunciation. In that case, the Mayan symbol with the Spanisb "B" on top should bave been read not simply as the sound "B", but as "BÉ", as this was the name of the Spanish letter. Knorozov tried to read the texts: de Landa's alphabet made sense.

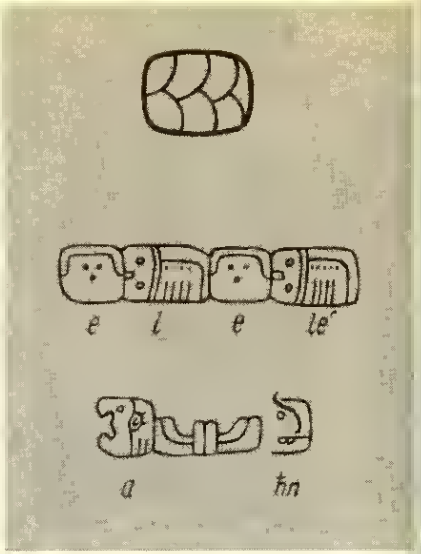
Next, the scholar went on to decipher de Landa's examples, which had puzzled so many researcbers. De Landa had written the word "LÉ" as "ELÉELÉ". The name of the Spanish letter "L" is "ELÉ"—but de Landa had used it twice in succession.

Knorozov made another dazzling guess: suppose, when pronouncing the word "LÉ" in Mayan, de Landa had first named the cbaracters in the Spanish way—"ELÉ" and "E"—and then pronounced the whole of the word "LÉ"? That would account for his "ELÉ"-"E"-"LÉ", the scholar decided.

The Indian scribe, who must have bungled the dictation, had apparently recorded everything he heard in hieroglyphs. Tbat must have been how the absurd "ELÉELÉ" came about.

The guess was completely correct.

De Landa had deciphered the alphabet with expertise, and four centuries later the perseverance of a young Soviet scholar bad step by step reconstructed his cbain of tbought, and opened for the world

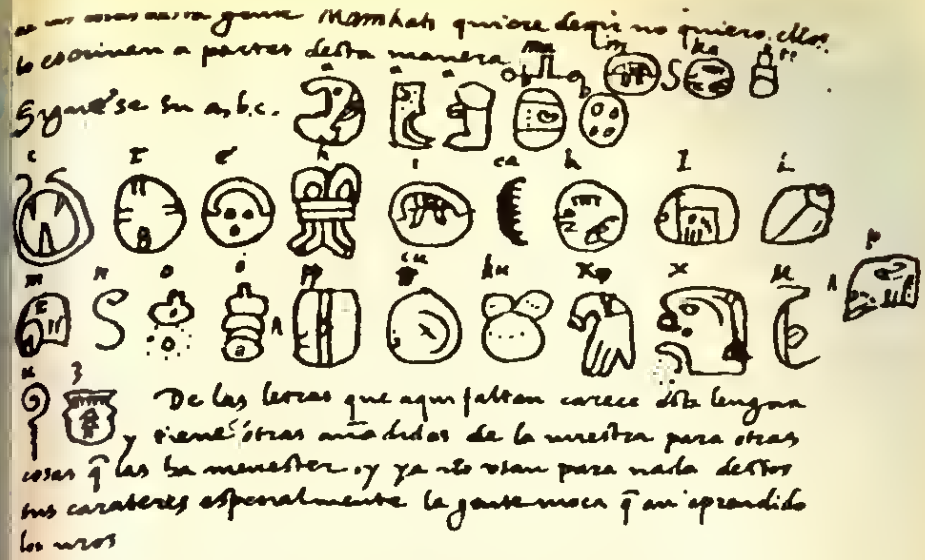


a window on one of the most remarkable achievements of past civilizations.

In unravelling the secret of the Mayan language, Knorozov made three assumptions, each of which was eventually confirmed. He assumed that the hieroglyphs had no intrinsic meaning, that de Landa had given the symbols the names of Spanisb letters and he had guessed tbe nature of the Indian scribe's mistake.

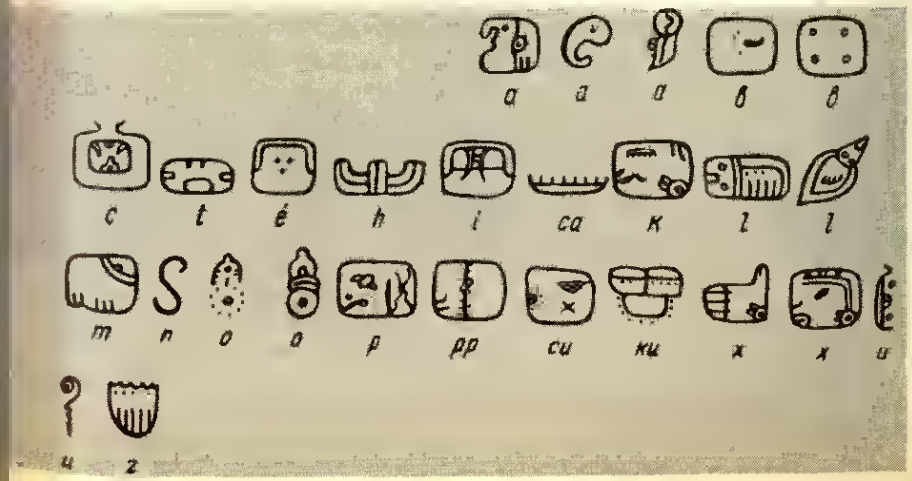
His fourth assumption bore tbe mark of genius just as mucb as the first three. But here one must digress.

Unlike English, most languages are inflected. This means that most of the words in them change in form according to their grammatical relation to the other words in a sentence. The variable part of tbe word is called the inflexion, and the



Seven Mayan characters created what seamed to be an insurmountable problam which stopped all further research (picture, left). Diego de Landa tried to organise these symbols into a system which proved just as baffling as the Mayan language itself (top picture).

Yuri Knorozov found the key to the de Landa alphabet. He established that the Mayan symbols represented individual sounds, and not words. De Landa knew that, and arranged the picture-letters in the order of the Spanish alphabet (Below).



non-variable part the root. Mayan was an inflected language, and Knorozov decided to sort out the variable elements from the roots in the hieroglyphic texts.

That was a berculean task. The hieroglyphs had to be brought together in groups. A group comprised hieroglyphs with a single root but witb different variable elements.

The next step was to calculate the incidence of some of the variable elements occupying a certain position in the word. That gave rise to techniques of "positional statistics", as Knorozov called them. The grammatical indices of ancient Mayan could now be compared with those of the sixteenth-century Mayan language which had survived in the *Books of Chilam Balam.*

The ancient texts in these books had been restored from memory by priests—but in Latin letters instead of in hieroglyphs.

At first Knorozov applied his techniques to the study of word order. It transpired that most second and third places in sentences were occupied by hieroglyphs without variable elements. At the same time nearly all the hieroglypbs with the highest number of variable elements were placed first.

Knorozov tried another guess: the former were subjects expressed by nouns, the latter, predicates expressed by verbs.

Comparison with the sixteenth-century Mayan language confirmed the correctness of the guess.

Tbe process of comparing the two versions of the language was most involved. The texts recorded in Latin letters, although they were regarded as familiar and were used as control texts, had not, in fact, been studied. Knorozov had to study their grammar—a formidable job, as he admits.

In addition, there was no guarantee that the results would advance the deciphering. Fortunately, as shown above, this work was extremely useful in comparing the ancient and sixteenth-century texts.

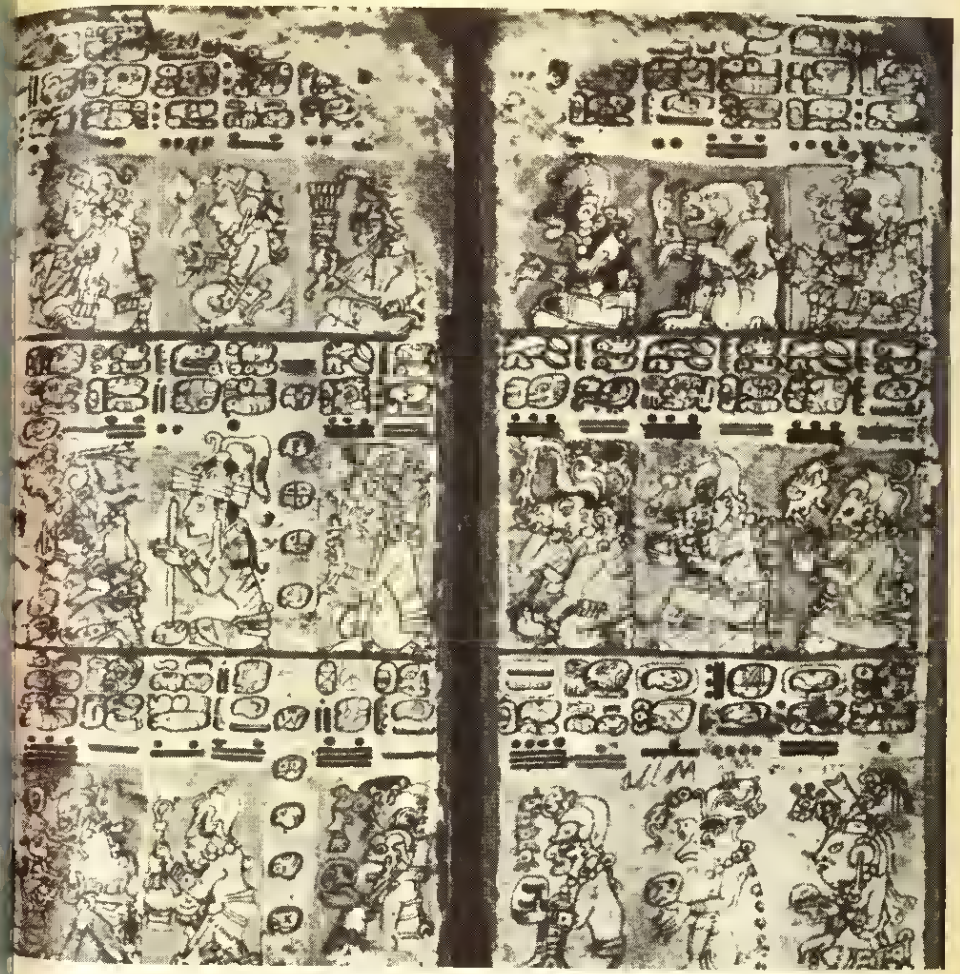
Knorozov's "positional statistics" techniques have become a vital tool of linguistics, providing a clue to the texts of ancient peoples, a clue which had been believed lost beyond recall. The new method constituted a major step towards programming the decoding process for the computer.

★ ★ ★

In 1955, the Academic Council of the Etbnography Institute of the USSR Academy of Sciences heard a young historian present a thesis for his master's degree. There was nothing out of the ordinary about the man—he was short and slim, he appeared sby and spoke quietly and calmly. On the face of it, this was an ordinary session of an academic council.

But instead of the master's degree, the council conferred upon the aspirant a doctor's degree. The scholar's work set the wbole world astir: the mystery of the Mayan writings had been solved.

The young doctor's name was Yuri Knorozov.



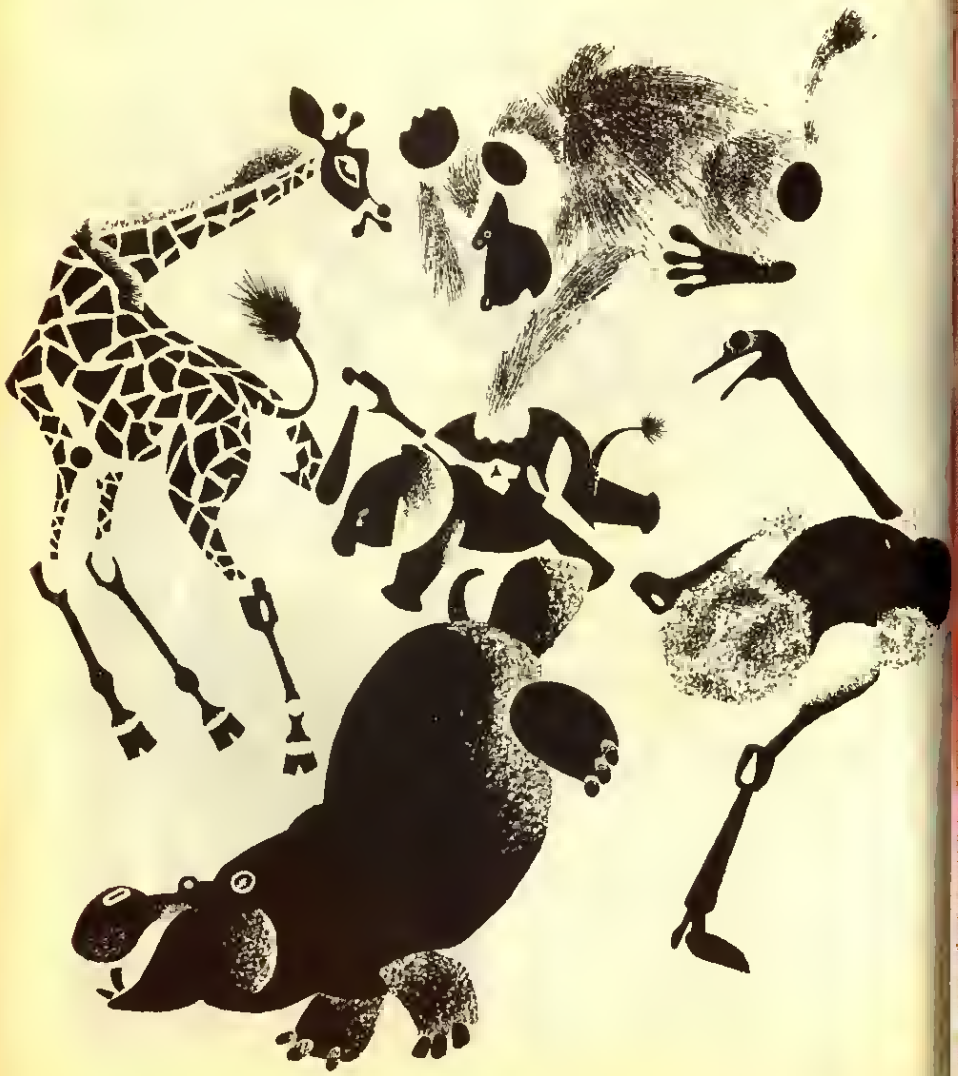
A fragment of a Mayan manuscript from a library in Dresden.

Soviet illustrations to English children's literature

There is something international about the best children's stories— they are loved the world over. Many of the classics of English children's literature are well-known in the USSR. In Soviet times, 3,364 of these books have been published there, a total of more than 16,000,000 copies. Soviet artists give their own interpretations of some of the more familiar characters, as you can see on the following pages.

"Rikki-Tikki-Tavi", by Rudyard Kipling. V. Kurdov.

"The White Elephant's Child", by Rudyard Kipling. V. Lebedev.



Back cover of Kipling's collection of poems. D. Sterenberg

Above, opposite: Mowgli, Bagheera, Kaa and Baloo, from the "Mowgli Stories", by Rudyard Kipling. V. Batagin.

"40 North, 50 West", by Rudyard Kipling. D. Sterenberg.

"Pushmi-Pullyu", by Hugh Lofting. E. Safonova.

Dr. Dolittle, by Hugh Lofting. V. Konashevich.

Left: Winnie-the-Pooh, Rabbit, Tigger, Kanga, Baby Roo, Piglet, and Christopher Robin, from A. A. Milne's "Winnie-the-Pooh". B. Diodorov, G. Kalinovsky.

The Pobble Who Has No Toes, from Edward Lear's "Nonsense Rhymes". M. Kabakov.

"Alice in Wonderland". V. Alfeyevsky.

Robin Hood. V. Tronov.

Right, cover for "Jack the Giant-Killer and Other Stories for Children". F. Lekmul.

Old King Cole. Y. Vasnetsov.

"Great Expectations", by Charles Dickens. E. Budogosky.

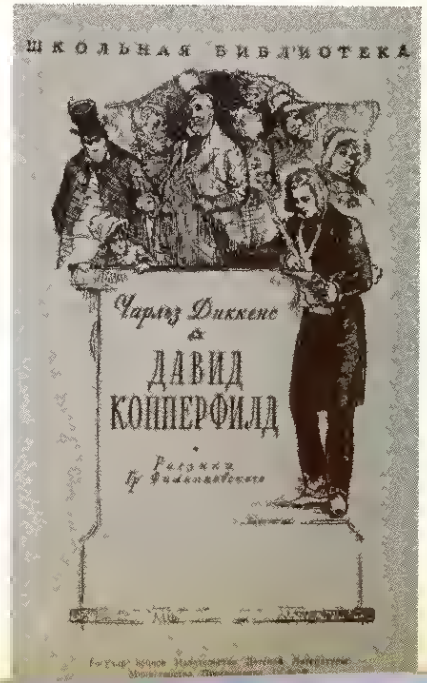
Title page for "Treasure Island", by Robert Louis Stevenson. S. Pozharsky.

Right: "The Black Arrow" by Robert Louis Stevenson. N. Krivov.

Title page for "Gulliver's Travels", by Dean Swift. G. Morzhen.

Captain Smollett, from Stevenson's "Treasure Island". P. Bunin.

Title page for "David Copperfield", by Charles Dickens. G. Filippovsky.



Autumn styles

After a rainy September, golden autumn has set in in Moscow. The trees are a blaze of colour, and spiders webs float through the air like gossamer. The sun is gentle, not savagely scorching as it was two months back. This is a time both beautiful and sad, for it is the prelude to many cold, sunless days. In such in-between weather a trouser suit is useful. The one shown on the left is in white wool.

A cape is the thing when autumn days begin to get a little colder. We are likely to see many of them in Moscow before long.

An evening dress for a grand occasion. In wool crepe, it is based on a traditional Russian style.

Dress for day wear, sporty but elegant, so that a girl can go on to her date after work in it without a qualm.

KEEPING IT COOL IN THE DESERT

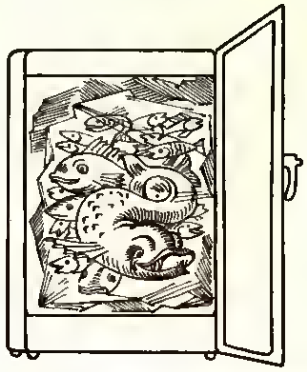
from the weekly
NEDELYA

A summer heat of 120 deg. F sizzles the Sherahad Steppe where the Kara Kum Desert slopes upward to the Pamirs. For nomad desert dwellers of 2,000 years ago, transport of cool water was essential. The tribesmen devised their own portable desert fridge, a porous clay jar. Cold water impregnated the clay and created a protective film on the jar's corrugated surface, reducing heat and keeping the water at refreshing temperature.

From their parents the brothers Khamro and Tilyabay Ashurbaev learnt the secret of the desert fridge—it had been handed down from generation to generation. To make a jar of this kind requires a special clay and the knowledge of all the finer points involved in handling it. The Ashurbaevs supply these porous, water-cooling vessels to all their neighbourhood, and the demand is always increasing.

Soon a Sherabad factory will begin making these wonderful water-carriers on a commercial scale.

* * * * *



A THOUSAND YEARS FROZEN

Fifty frozen fish up to 56 inches long have been found on the surface of a glacier in the Antarctic. They are believed to have inhabited the area a thousand years ago.

from RYBNOYE KHOZYAYSTVO
(Fishery Industry)

RUSSIAN MADE EASY

Lesson Twelve — Урок Двенадцатый

Письмо домой

orogáya Méri! ороrая Мэри! ear Mary!	Dear Mary!
a uzhé dva dnyá v Rostóve. уже два дня в Ростове. already two days in Rostov.	I've been in Rostov for two days.
a priyékhal v Rostóv v subótu. приехал в Ростов в субботу. arrived in Rostov in Saturday.	I arrived in Rostov on Saturday.
góda zdyes″ óchen″ tyóplaya. года здесь очень тёплая. eather here very warm.	It is very warm here.
voskresénye ya gulyál po górodu, воскресенье я гулял по городу, Sunday I walked about town,	On Sunday I took a stroll around the town,
na plyázhe. на пляже. on beach.	and went to the beach.
Rostóve khoróshii plyazh остове хороший пляж Rostov good beach	There is a good beach in Rostov
bol″sháya reká Don. большая река Дон. big River Don.	and the River Don is wide.
kholódnaya, no холодная, но r cold, but	The water is cold, but
ávayu khoroshó i mnógo kupálsya. аваю хорошо и много купался. im well and much bathed.	since I'm a good swimmer I have been bathing a lot.

V srédu ili v chetvérg		On Wednesday or Thursday
В среду или в четверг		
In Wednesday or in Thursday		
ya poyédu v Sóchi.		I shall leave for Sochi.
я поеду в Сочи.		
I shall go in Sochi.		
Tam yeschyó zhárko.		It's still hot there.
Там ещё жарко.		
There still hot.		
Pishí v Sóchi. Tvói Dzhon.		Write to me in Sochi. Yo
Пиши в Сочи. Твой Джон.		John.
Write in Sochi. Your John.		

Answer the following questions. Check with the text above.

1. Когда Джон Смит приехал в Ростов?
2. Какая погода в Ростове?
3. Что он делал в воскресенье?
4. Когда Джон Смит поедет в Сочи?
5. Какая там погода?

Read the following dialogue. Pay attention to the phrases in bold type.

Dáite, pozháluista,		Please give me
— Дайте, пожалуйста,		
Give, please,		
tri konvérta,		three envelopes,
три конверта,		
three envelopes,		

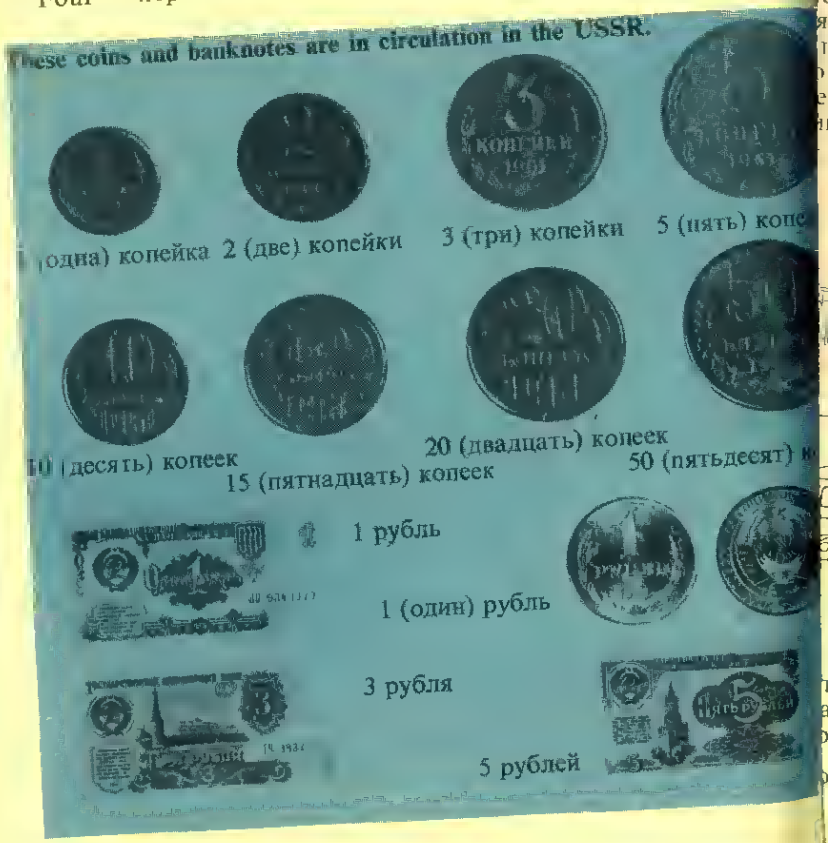
dve otkrÍtki,		two postcards
две открытки,		
two postcards,		
chetÍre márki.		and four stamps.
четыре марки.		
nd four stamps.		
Kakíye konvértI?		Which kind of envelopes?
Какие конверты?		
What envelopes?		
Dlya áviapóchtI.		Air-mail.
Для авиапочты.		
For air mail.		
Kakíye márki?		Which stamps would you like?
Какие марки?		
What stamps?		
Sámlye krasívlye.		The ones with the most attractive designs.
Самые красивые.		
Most béautiful.		
Kudá vI poslláyete pis″mó?		Where is the letter going?
Куда вы посылаете письмо?		
Where you send letter?		
Lóndon.		To London.
Лоидон.		
London.		
latítye, pozháluista,		That will be
латите, пожалуйста,		
ay, please,		
″desyát kopéyek.		60 kopecks, please.
ъдесят копеек.		
kopecks.		
kól″ko stóit pis″mó ávia?		How much is an air-mail letter?
колько стоит письмо авиа?		
ow much cost letter air mail?		
udá?		Where to?
уда?		
here?		

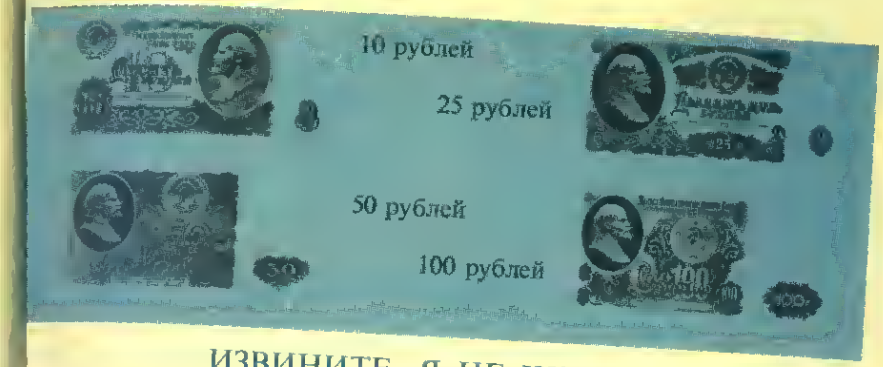
V Moskvú. — To Moscow.
— В Москву.
In Moscow.

Shest″ kopéyek. — Six kopecks.
— **Шесть копеек.**
Six kopecks.

A otkrítka? — And a postcard?
— А открытка?
And postcard?

Chetíre kopéiki. — Four kopecks.
— **Четыре копейки.**
Four kopecks.



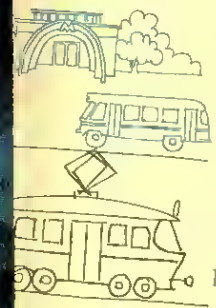


ИЗВИНИТЕ, Я НЕ ЧИТАЮ

На почте студент пишет письо домой. Другой человек сидит ядом и читает его письмо. тудент пишет: «Кончаю; какой- человек читает письмо и ешает мне.» «Извините,* вы шите неправду: я не читаю,» сказал человек.

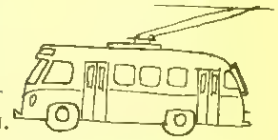
A student is writing a letter at the post office. Another man is sitting next to him, reading his letter. The student writes: "I shan't write any more; someone is reading this over my shoulder, and it's disturbing me." "Excuse me, it's not true what you've written. I am not reading your letter," the other man says.

Travel Fast and Cheap



1 билет на метро, автобус стоит 5 (пять) копеек.

1 билет на троллейбус стоит 4 (четыре) копейки.



1 билет на трамвай стоит 3 (три) копейки.

1 километр на такси стоит 10 (десять) копеек.

the following dialogue. Find the phrases with numerals.

В КАФЕ

то вы хотите?
ашку кофе, два бутерброда
ром и три пирожка.
фе одну чашку?

"What can I get you?"
"A cup of coffee, two pieces of bread and cheese, and three pies."
"One cup of coffee?"

— Нет, две чашки, пожалуйста.

Скажите, который час?

— Сейчас три часа.

— Я спешу. Скажите, сколько стоит мой завтрак?

— 60 копеек.

— Получите.

"No, two cups, please.

What's the time?"

"Three o'clock."

"I'm in a hurry. What do I ow

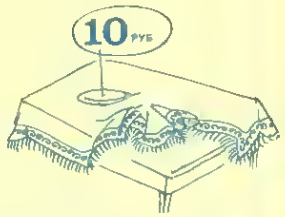
for my lunch?"

"60 kopecks."

"Here you are."

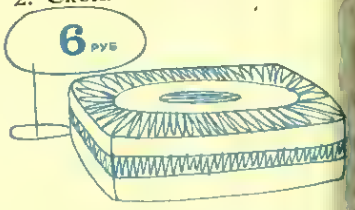
Answer the following questions. See the key.

1. Сколько стоят эти матрёшки?



2. Сколько стоит эта скатерт

3. Сколько стоит платок?



4. Сколько стоит шкатулка

СКОЛЬКО СТОИТ ОСЁЛ?

На базаре человек продаёт осла.

— Сколько стоит осёл?

— Двадцать копеек. А кошка стоит сто рублей.

— Почему осёл стоит только двадцать копеек, а кошка так дорого?

— Осёл без кошки не продаётся.

A man has a donkey to sell at market.

"What do you want for donkey?"

"Twenty kopecks. But the cat a hundred roubles."

"Why is the donkey only t kopecks and the cat so expens

"You can't buy the donkey out the cat!"

Odín um khoroshó,
Один ум хорошо,
One mind well,

a dva lúchshe.
а два (ума) лучше.
but two (minds) better.

Two heads are better than one.

Mnógo búdyesh znat″
Много будешь знать,
Much will know

kóro sostárishsya.
коро состаришься.
oon will age.

Too much knowledge brings grey hairs.

kól″ko ludéi, stól″ko
колько людей, столько
low many people, so many

As many men, as many minds, as many countries, as many customs.

nóv, skól″ko stran, stól″ko
мов, сколько стран, столько
inds, how many countries, so

Ichayev.
ычаев.
any customs.

exercise on page 182

и матрёшки стоят два рубля.
а скатерть стоит десять блей.
3. Этот платок стоит три рубля.
4. Шкатулка стоит шесть рублей.

VOCABULARY (СЛОВАРЬ)

ус, -ы	*avtóbus, -I*	bus, buses
-ы	*bazár, -I*	market, markets
-ы	*bilyét, -I*	ticket, tickets
брод, -ы	*buterbród, -I*	open sandwich, sandwiches, slice of bread
	vodá	water

дорого	*dórogo*	expensive
жарко	*zhárko*	hot
завтрак, -и	*závtrak, -i*	breakfast
извинить	*izvinít"*	to excuse
сыр	*sIr*	cheese
или	*íli*	or
кафе	*kafé*	café
километр, -ы	*kilométr, -I*	kilometre, kilometres
конверт, -ы	*konvért, -I*	envelope, envelopes
копейка, -и	*kopéika, -i*	kopeck, kopecks
который час	*kotórIi chas*	what's the time?
кофе	*kófe*	coffee
кошка, -и	*kóshka, -i*	cat, cats
купаться	*kupát"sya*	to bathe
марка, -и	*márka, -i*	stamp, stamps
матрёшка, -и	*matryóshka, -i*	matryoshka doll
метро	*metró*	metro
минута, -ы	*minúta, -I*	minute, minutes
неправда	*nyeprávda*	untruth
осёл, ослы	*osyól, oslÍ*	donkey, donkeys
открытка, -и	*otkrÍtka, -i*	postcard, postcards
пирожок, пирожки	*pirozhók, pirozhki*	pie, pies
платить	*platít"*	to pay
платок, платки	*platók, platkí*	headscarf, headscarves
пляж, -и	*plyázh, -i*	beach, beaches
погода	*pogóda*	weather
получать	*poluchát"*	to receive
посылать	*posIlát"*	to send
почта	*póchta*	post office
продавать	*prodavát"*	to sell
река, -и	*reká, réki*	river, rivers
скатерть, -и	*skátert", -i*	table-cloth, table-cloths
сколько стоит	*skól"ko stóit*	how much does it cost?
спешить	*speshít"*	to be in a hurry
такси	*taksí*	taxi
тепло	*tyepló*	warm
трамвай, и	*tramvái, -i*	tram, trams
троллейбус, -ы	*trolléibus, -I*	trolleybus, trolleybuses
холодно	*khólodno*	cold
чашка, -и	*cháshka, -i*	cup, cups
шкатулка, -и	*shkatúlka, -i*	casket, caskets

Lesson compiled by Natalia Schmidt, Alla Frolkina, Marina Baturi

DON'T FORGET!

The NEW "Russian For You" series—up to date and easy to starts in SPUTNIK next month.

IN NEXT MONTH'S SPUTNIK

SOVIET 'AGENT 03'

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