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**Санкт-Петербургский государственный технологический
университет растительных полимеров**

АНГЛИЙСКИЙ ЯЗЫК

**Пособие для чтения для студентов
1 курса всех факультетов**

Санкт-Петербург
2000

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Санкт-Петербургский государственный технологический
Университет растительных полимеров

Кафедра Иностранных языков

Английский язык

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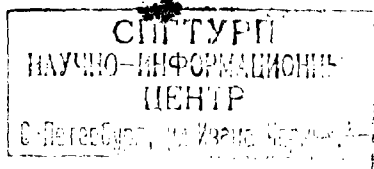
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**ВОЗВРАТИТЕ КНИГУ НЕ ПОЗЖЕ
обозначенного здесь срока**

НАУЧНО-ИНФОРМАЦИОННЫЙ ЦЕНТР САНКТ-ПЕТЕРБУРГСКОГО ГОСУДАРСТВЕННОГО ТЕХНОЛОГИЧЕСКОГО УНИВЕРСИТЕТА РАСТИТЕЛЬНЫХ ПОЛИМЕРОВ

I'M A FIRST-YEAR STUDENT

My name's (Petrov V.). I'm a first-year student of St. Petersburg state technological university of plant polymers. I study at the chemical technological department (faculty) (the department of mechanics of automated systems of production, the department of economics and production management, the department of industrial heat-power engineering, the department of automated control systems of technological processes, the evening department, the correspondence department.)

I got interested in chemistry when I was at school and now it's my favourite subject. I think I'm good at it. It's also the key subject at our department. Besides chemistry the first-year students study mathematics, physics, history of Russia, technical drawing, informatics, a foreign language and some other subjects. My weak point is English I have to work hard at it in order not to lag behind the group.

We have lectures, classes and work in the laboratories. As a rule we have three or four lectures a day. Our lectures begin at 9.30 or sometimes at 7.45. So I have to get up very early in order not to be late for them. I go to the University by underground (by bus). It takes me about an hour to get to the University. We try not to miss classes and lectures. We usually take notes at the lectures as it will be easier to read up for our exams. We'll have our exams in January and then we'll have vacation.

It's very interesting to study new subjects, but it's not always easy to work regularly.

There are 26 students in our group. Many of them live in the dormitory (student hostel).

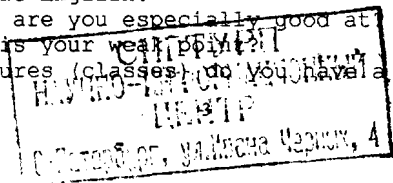
It's not far from the University and they walk there. Our dean is associate professor... Our subdean is...

The dean's office is on (the third) floor.

We have to study hard so we don't have free time on week days. At weekends we go to the cinema, theatre, museums, exhibitions, or to a disco.

Answer the following questions

1. What university do you study?
2. What department (faculty) do you study at?
3. What year student are you?
4. What subjects do you study?
5. Which is your favourite subject?
6. Are you good at English?
7. What subjects are you especially good at?
8. What subject is your weak point?
9. How many lectures (classes) do you have a day?



10. What time do they begin?
11. Do you always come in time to the University?
12. Do you attend the lectures regularly?
13. Why do you sometimes miss lectures (classes)?
14. Do you take notes at the lectures?
15. What do students have to do (in order) to make progress in a foreign language?
16. How many exams (final tests) will you have in winter (summer)?
17. In what subjects?
18. What time do you have to get up in order not to be late for lectures?
19. How long does it take you to get to the University?
20. Do you go to the University by underground or by bus?
21. Do you walk to the University?
22. How many students are there in your group?
23. Do you live in one of the dormitories or with your parents?
24. Is St. Petersburg your native (home) town?
25. Do you like St. Petersburg? Why?
26. What do you usually do in your free time?

ST. PETERSBURG

Notes

Memorial	Памятник
Inspiration	Вдохновение
Connect	Связывать
Higher educational establishment	Высшее учебное заведение
Embankment	Набережная
In themselves	Сами
Create	Создавать
Area	Площадь, район
Death	Смерть
By right	По праву
Adopt	Принимать
heroism	Героизм
Display	Проявлять
receive	Получать

We live in one of the most beautiful cities of the world, the second largest industrial, cultural and scientific centre of our country. The population of St. Petersburg 5 million people and it covers the area of over 600 sq.km. The city was founded in 1703 by Peter the Great and was called St. Petersburg. For two centuries (from 1712 till 1918) it was the capital of Russia.

Every building in St.Petersburg is a memorial, every stone is history. It gave inspiration to many great poets, writers, painters, sculptors, composers, and actors.

The life and work of Pushkin, Lermontov, Belinski, Chernyshevsky, Glinka, Tchaikovsky, Rimsky-Korsakov, Repin, Kramskoi, Shevchenko, Block and Mayakovski were connected with this city,

Today there are about 50 higher educational establishments, over 60 theatres and more than 160 museum in St.Petersburg.

St.Petersburg's streets, embarkments and squares are in themselves works of art created by great masters: Rastrelli, Zakharov, Voronikhin, Rossi, Stacov and others.

Unit 1

Text A

ENGLISH PEOPLE AS THEY ARE

One of the most striking features of English life is the self-discipline and courtesy of people of all classes. There is little noisy behaviour, and practically no loud disputing in the street. People do not rush excitedly for seats in buses or trains, but take their seats in queues at bus stops in a quiet and orderly manner.

Englishmen are naturally polite and are never tired in saying "Thank you," "I'm sorry," "Beg your pardon." If you follow anyone who is entering a building or a room, he will hold a door open for you. Many foreigners have commented on a remarkable politeness of the English people.

English people don't like displaying their emotions even in dangerous and tragic situations, and ordinary people seem to remain good-tempered and cheerful under difficulties.

The Englishman does not like any boasting or showing off in manners, dress or speech. Sometimes he conceals his knowledge: a linguist, for example, may not mention his understanding of a foreigner's language.

The Englishman prefers his own house to an apartment in a block of flats, because he doesn't wish his doing to be overlooked by his neighbours. "An Englishman's house is his castle."

Many Englishmen are very good to their wives at home. They help their wives in many ways. They clean the windows when they are at home on Saturday afternoon. They often wash up the dishes after supper in the evening.

Sunday is a very quiet day in London. All the shops are closed, and so are the theatres and most of the cinemas. Londoners like to get out of town on Sundays. The sea is not far - only fifty or sixty miles away and people like to go down to

the sea in summer or somewhere to the country for skiing in winter.

These are some interesting English customs.

Unit 2

Text A

THE FIRST RUSSIAN WOMAN-SCIENTIST (1850 - 1891)

A great Russian mathematician, Sophia Kovalevskaya lived and worked in the second half of the 19th century. It was the period of Russia's progress in science and culture. It was the time when Lobachevsky created a new non-Euclidean geometry and Chebyshev organized a new school of mathematicians.

Sophia was born in Moscow on February 15, 1850 in a well-off family¹ but spent her childhood in a village. Her father, a well-educated person himself gave a good education to his children. When Sophia was eight an experienced teacher taught her arithmetic, grammar, literature, geography and history. The girl showed an unusual gift in mathematics and at the age of twelve puzzled her teacher when she gave a new solution to a difficult unsolved problem.

In 1867 Sophia wanted to continue her studies in St. Petersburg, where her family spent winters. But it was impossible for a woman to attend lectures at the University. Even Chebyshev who at that time headed the Russian mathematical school had no right to allow her to attend his own lectures. The only way out for her² was to go abroad, but in this case there was a condition that the woman should be married³. Sophia married Vladimir Kovalevsky and soon left Russia.

Sophia Kovalevskaya studied at the Heidelberg University, she attended lectures and did a lot of research and practical work.

In 1871 the Kovalevskys went to Berlin. During four years in Berlin Sophia wrote three dissertations. When three scientific masterpieces by Kovalevskaya appeared in 1874, Hettingen University awarded her the Degree of Doctor of Philosophy.

On her return to Russia she vainly tried to get a post at St. Petersburg University. The tsarist Government didn't want to have women-professors. Again S. Kovalevskaya returned to Berlin where she completed her work on the refraction of light in crystals.

In 1883 she accepted the offer of Stockholm University and was elected professor of mechanics and held this post until her death in 1891. In her numerous scientific works Kovalevskaya solved the problems which many scientists couldn't solve during many years. When she became a world-famous scientist, Kovalevskaya won recognition⁴ in her own country. In 1889 she was elected a Corresponding member⁵ of the Russian Academy of Sciences.

Notes

1. **a well-off family** - состоятельная семья
2. **the only way out for her** - единственным выходом для нее
3. **the woman should be married** - женщина должна быть замужем
4. **to win recognition** - получить признание
5. **a Corresponding member** - член-корреспондент

Text B

OXFORD AND RUSSIA

It seems that the first Russian to come to Oxford was Peter the Great who paid an unofficial visit to Oxford on 8 April 1698. The Journal of the Emperor contains a description of Oxford, the first in Russian literature. It reads: "Oxford is an excellently built city and has a famous university, which was founded in 880 or 895 by King Alfred; there is here a renowned library. The students live in 18 colleges. They have for their pleasure excellent gardens; their dress is uniform and distinguishes them from others. This town has the privilege of sending two deputies to Parliament; and the University has likewise, the privilege of sending two deputies there."

In 1879 Oxford University conferred an honorary degree on Ivan Turgeneff. About the same time the University published the first Russian Grammar.

Since the beginning of the twentieth century the study of Slavonic languages and literatures has come into line with that of other modern languages and literatures.

In 1945 a Chair of Russian was established in the University. Serious specialization and research in the history of language, literature became possible.

In 1962, Soviet writer Kornei Chukovsky received an honorary degree of Doctor of Letters at the University of Oxford.

Unit 3

Text A

THE SOLAR SYSTEM

There is nothing more important to life than the sun. It gives us heat, light, power and food and all the beauty of colour and form in nature.

The sun is a star. There are many thousands of stars in the sky that are like the sun. They are as large as the sun, as hot as the sun and contain the same chemical elements. The

sun is a great mass of white hot matter. The temperature at the sun's centre is as high as 10,000,000 C°.

The sun is much nearer to us than other stars. That is why we think that it is bigger and brighter than other stars. The average distance of the sun from the earth is as much as 150 million kilometres. It is difficult to realize such a distance. But it is much more difficult to realize the distances of the stars which are millions and millions of kilometres still farther away. To express these great distances the astronomers use a very much larger scale than kilometres. Nothing in the world moves faster than light. It moves at the rate of 300,000 kilometres per second. So the astronomer's unit of measure is one light year, the distance that light travels in one year. This distance is a little less than 9,5 million kilometres. Most of the stars are thousand light years away from the earth. It is hard to realize that these are not the greatest distances in the world.

* * *

Our sun and our earth, our moon and the planets, meteors and comets belong to the "family of the sun" which we call our "solar system".

Our solar system consists of nine planets and their moons.

The closest planet to the sun is Mercury. No other planet receives more light and heat than this one. It is the smallest of the planets. Mercury revolves around the sun at a higher rate of speed than other planets. Its speed is much higher than theirs.

Jupiter is the largest planet in the solar system. Venus is not so large as Jupiter, but it is the brightest planet in the sky. We see its quiet light in the morning as well as in the evening. When it is in the West it is the first point of light which we see in the evening. We see it best of all on a dark night. The darker the night grows the brighter it shines and the better we see it. When Venus appears in the East it is possible to see it in the early morning hours as well.

Mars shines with a reddish light. The appearance of Mars varies from year to year. It depends upon the distance of the planet from the earth. It is closest to us every two years and two months. At such times Mars looks like a red lamp in the sky. The telescope reveals bluish markings on the planet. They vary with the changes of seasons. Mars has an atmosphere though it is not so dense as that of the earth. Most astronomers think that there is plant life on Mars.

The last opposition of Mars when it is nearest to the earth took place at the beginning of September 1956. Astronomers of all the world observed Mars and took photographs of the planet.

The results of their most important observation will help them to make a better study of the nature of Mars.

Notes

1. 10,000,000 C⁰ = ten million Centigrades - 10 млн.градусов по Цельсию.
2. That is why - вот почему
3. To take place - иметь место
4. To take photographs - фотографировать

Text B

HIGHER EDUCATION IN GREAT BRITAIN. UNIVERSITIES

In England there are 46 universities. Let's name some of them: Oxford, Cambridge, London, Liverpool, Leeds, Manchester, Nottingham Universities. Of these Oxford is the oldest and Nottingham is the youngest for it received its charter¹ in 1948. London University is the biggest of the modern ones. It has a large number of various colleges and other institutions.

The entrance exams at the universities are very strict, but at the University of Sussex and some others one can see some relaxation at entrance exams. Most universities offer courses in arts and science.² In new universities they make experiments in teaching methods. Some of the newer universities concentrate on technology. A university has a number of faculties: art, law, music, economics, education, medicine, engineering, etc. After a student studies three years at a college, he may proceed to a Bachelor's degree³ and after he graduates from the university he may proceed to the degree of Master and Doctor.⁴ Students attend lectures delivered by professors or readers.⁵ In the scientific departments⁶ demonstrations in the laboratories (labs) or in the field follow the lectures. Tutors⁷ supervise the students' studies. Advanced and capable students work in close connection with the teaching staff and carry on research which results in a discovery sometimes.

University teaching combines lectures, practical classes (in scientific subjects) and small group teaching in either seminars or tutorials⁸ which are a traditional feature of the University of Oxford and Cambridge. At any college there are museums, labs, lecture rooms and workshops for different subjects.

One must say that some of our remarkable Soviet scientists and writers are honoured doctors of Cambridge and Oxford universities.

What is a British university? A British university consists of a great variety of colleges and other institutions. Cambridge University is a body of over 55,000 members, 7,000 of whom are graduates. Each university has different courses, the number of credit tests⁹ varies too.

What is a college? It is a hostel where the students live, have their meals, study under the supervision of tutors and read subjects at the library. Sometimes they attend tutorials if a certain professor lives in the same college. As for lectures students attend them in different colleges of the town. At the college they get general education but they will learn special subjects at the University. It is in general not possible to be a member of the University and not to be a member of one of the constituent colleges. It is also not possible to be a member of a College and not to be a member of the University.

The College and the University form a closely integrated whole which is the result of some 700 years of natural growth.

One must mention that the University fee is high enough: students must pay for tuition,¹⁰ application, exams, credit tests and so on.

Notes

1. charter - устав
2. art and science - гуманитарные и естественные науки
3. Bachelor's degree - звание бакалавра, присваивается после трехлетнего или четырехлетнего обучения в университете и примерно соответствует русскому «диплом об окончании университета».
4. The degree of master - ученая степень магистра, присваивается примерно после одного года учебы в аспирантуре; The degree of Doctor - ученая степень доктора философии (полностью: Doctor of Philosophy), соответствует русскому «кандидат» (любых наук, не обязательно философских). Русскому ученому званию «доктора» каких-либо наук соответствуют в Англии звания: Doctor of Letters (доктор гуманитарных наук) и Doctor of Science (доктор естественных наук)
5. reader - лектор, доцент вуза
6. scientific department - факультет естественных наук
7. tutor - руководитель группы студентов в английском университете
8. tutorial - консультация, встреча с руководителем
9. credit test - зачет
10. tuition - обучение

Text C

THE DIFFERENCE¹ BETWEEN BRITISH AND AMERICAN ENGLISH

When English people go to America, or when Americans come to England, they usually have no difficulty in understanding one another. Still, there is a certain² difference between the English language as it is spoken in these two countries. And the difference is not only in the pronunciation and intonation, but also in the vocabulary, and even in the grammar.

Anyone reading American literature will notice³ that there are also some differences in spelling,⁴ as for example color, favor, harbor, honor, labor which in the British spelling are written with the suffix -our.

In America "good-bye" is written without the "e", and the words centre, metre, theatre and others like them are written center, meter, theater. The simplified⁵ spelling of "through" and «although" as "thru" and "altho" is used by some American magazines and newspapers.

If you have listened to Americans speaking, you have probably noticed that they pronounce such words as ask, class, glass, grass, last, pass, past with the sound⁶ []. Americans also pronounce answer, dance, plant, aunt as [ns], [d ns], [nt]. The American pronunciation of "either", "neither" as ['i: er], [ni: r] may be difficult to understand at first.

A marked⁷ difference between American and British English is the reading of the letter "r". As you know, the English read such words as "worker" and "teacher" without the sound [r], while an American reads all the r's, only the sound is different in quality.

The differences in grammar are few in number,⁸ as for example the use of "will" instead of "shall" in the Future Indefinite tense forms, and the extensive⁹ use of the auxiliary¹⁰ verbs "do", "does", "did" with the verb have. Where an Englishman would say "I have no money" or "I haven't got any money", an American would say "I don't have any money".

The use of prepositions¹¹ also varies in the two countries. In England people say "at school", "at the corner of the street", while in America people say "in school" and "on the corner". In England one lives in the street, but in America one lives on the street. An Englishman looks at his watch and says "It is twenty-five to five", where an American would say "It is twenty-five of five".

It is an interesting fact that many British writers use some American written forms and some British written forms are used by many American authors.

Though the differences in pronunciation and spelling are important, modern linguists are of the opinion¹² that the most important difference between British and American English lies in the field of vocabulary.¹³

Meeting birds, animals and fish for which there were no English names, the first settlers took words from American Indian languages. From the Indians were taken many geographical names of rivers, mountains and lakes. In later years new ideas and new things led to new expressions and new meanings for old words.

When you come to America and want to continue your trip¹⁴ by railroad (not railway as the British call it), you won't buy your tickets at the booking office but at the ticket-window.

You walk out on the platform which is here, in America, called track. The train is already waiting and you quickly get into a car which in England you would call a carriage. If you want to meet your friend, it will be best to call him up. This is the same as to telephone him. He will tell you how to get to his hotel. Perhaps you will have to go there by subway by which the underground¹⁵ railway is understood. Or had you better take the trolley car? By the way, it is also called the street car. When you come to the hotel, you will surely get into the elevator (that is the lift) which will take you up to your friend's room. Your friend will possibly take you out for a walk to have a look at the shops or stores as they call them in America. And, then, I think, you will go to one of the movies which means in America the cinema.

Here is a list of words¹⁶ of the same meaning used in England and in America.

American English	British English	
Railroad	Railway	Железная дорога
Railroad car	Railway carriage	Вагон
Street car	Tram(car)	Трамвай
Trolley car		
Subway	Underground, tube	Метро
Sidewalk	Pavement	Тротуар
Baggage	Luggage	Багаж
First floor	Ground floor	Первый этаж
Movies	Cinema, pictures	Кинотеатр
Store	Shop	Магазин
Drugstore	Chemist's (shop)	Аптека
Candy	Sweets	Конфеты
Can	Tin	Консервная банка
To mail (letters)	To post (letters)	Отправить письмо
To call smb. up	To ring smb. up, To telephone	Позвонить по телефону

I guess	I think, I suppose	Я думаю, полагаю
Sure	Surely	Наверняка
Mad	Angry	Сердитый
Fall	autumn	Осень

During the last few decades,¹⁷ however, many changes have taken place in British English, especially in the vocabulary. The influence of American English is strongly felt, due to the large number of books, magazines and films, radio and television broadcasts¹⁸ coming from America.

Notes

1. difference - разница
2. certain - определенный
3. to notice - замечать
4. spelling - правописание
5. simplified - упрощенный
6. sound - звук
7. marked - зд. Заметный
8. few in number - невелик по количеству
9. extensive - широкий
10. auxiliary - вспомогательный (глагол)
11. preposition - предлог
12. are of the opinion - придерживаются мнения
13. vocabulary - словарь
14. list of words - список слов
15. decade - десятилетие
16. broadcast - трансляция

Unit 4

Text A

NEW METHODS OF COMPUTATION

We live in the age of great developments in science and engineering. More than two hundred years ago the invention of the textile machinery started the industrial revolution. In less than a century machines were in use in all the branches of industry. They were to make all kinds of operations of a factory worker. In fact they could make them much better, much quicker and at a lower cost than factory workers did. Moreover, a machine could do work which a man was unable to do. Thus the first industrial revolution freed man's hands from hard and monotonous labour.

At the end of World War II the second industrial revolution began. The invention of electronic computers makes it

possible to free man's brain from the labour of measurement and computation.

Accurate measurement and exact computation are the bases of modern engineering and scientific research, therefore every engineer must determine accurately the amount of any change that his material has to undergo in different conditions, either in arctic cold or tropical heat.

Every scientist will make numerous computations before he can say that the results of his experiments are correct. Yet there exist complex computations in science and engineering which scientists are unable to make because they are too long and too complicated. Here is an example which can illustrate how much time some of them may take. For the accurate forecasting of the weather a meteorologist must make about one million of operations. In order to be able to forecast the weather one day in advance, he has to work with a numerous group of assistants for ten days. This is not the only example; there are many others. When the first electronic computers went into operation in 1945 their importance for science and engineering became at once evident. They can work very quickly and make no errors. Any computer is a machine that gives information. This is the only thing a computer does. A computer cannot create any new information, though it may transform it into a more useful form. By analogy we may call a computer a mathematical translator in the same sense that a translator takes information in some language and translates it into another.

We may divide electronic computers into two groups: machines that can measure and those that can count. The latter can add, subtract, multiply and divide. Such machines are to do any operation which we can reduce to arithmetic. Besides they must be able to combine many problems and take them in any order.

Notes

1. in fact - в действительности
2. either ... or - или ... или
3. here is an example - вот пример
4. to go into operation - начать действовать (о неодушевленных предметах)
5. at once - сразу
6. by analogy - по аналогии
7. to be great help - оказывать большую помощь

Text B

POLYMERS - MATERIALS OF THE FUTURE

The polymer chemistry or, as it is also known, the chemistry of large molecules, has made a great progress in the last two or three decades. Before the war world production of polymers was only a few thousand tons, now the output reaches millions of tons. The annual increase in production is over 1000000 tons.

To have an idea of what polymer chemistry can do one should know that one ton of polyethylene replaces six tons of lead in the manufacture of electric cables. Ball bearings¹ made of synthetic plastics have a much longer life and do not have to be lubricated.

Higher speeds are one of the basic features of modern technical progress. The speed of all types of transport is growing and so the number of revolutions in engines is increasing. This calls for² new materials which can withstand higher temperatures. Not long ago chemists developed such materials. Polyacrilates compounds³ have many useful properties and are applied in many different ways. For instance, a film coated with this compound becomes noninflammable. The compound can be also used as electrical insulation and as a material for the production of foam plastics.⁴ It is resistant to concentrated acids, oils, benzine, and solvents.

New polymers were synthesized to obtain highly durable glass plastic which can operate for a long time at temperatures of +250 to 300°C.

The plastics made from these polymers will be widely used in the construction of aeroplanes, in engineering, ship-building, etc.

Nature spent hundreds of millions of years on reconstructing the complex molecules of organic substance and still did not create all the materials that man needs. Man has to create materials that do not exist in natural form and man really creates such materials in ever increasing quantities.

Half a century is not long in the history of civilisation. Synthetic polymers are still young and they have a big future.

Notes

1. ball bearing - подшипник
2. to call for - требовать
3. polyacrilates compounds - полиакрильные соединения
4. foam plastics - пенопласт

Text C

EDUCATION IN THE UNITED STATES

There is some difference between the system of public education in Great Britain and in the United States of America.

American education is more practical and less "academic" or abstract than British.

Most American children attend the state supported public schools. However, one must mention that the United States education is a function of each individual state. Each state provides money and controls education. There are 19,160 school districts in the United States and the character and quality of a school system depends on where it is, who pays for it and how much. When a child enters a school in the United States he begins a process of education which may last for many years.

A child has to begin his formal education at about the age of five if he attends kindergarten. The following year he enters the first grade¹ of primary or grammar school and each year afterwards he advances one grade. He finishes the sixth grade and graduates from grammar school at about the age of 12. Primary school children in the US have to learn much the same things as do children of the same age in other countries. They learn to read and write, to count and paint, to sing. They learn geography and history too. They also study the world and its people. Some schools teach modern languages, such as French, Spanish, Russian or German.

In most school systems junior high school follows primary one. This school, which serves as a connection between primary and high school, consists of three grades and serves children of 12 to 14 years of age. The subjects studied in junior school are more detailed. Children get more advanced knowledge and begin to concentrate on their special interests. They may choose to study foreign languages, advanced mathematics or sciences such as physics and chemistry. The high school prepares young people either to work immediately after graduation or for more advanced study in a college or university.

An American college is an institution of higher learning which lasts over a four year period and which grants Bachelor's degree at the conclusion of studies.

The students may gain a Master's degree with a year or two of further study. After another year or two of study and research they may gain a still higher degree of study and research as Doctor of Philosophy.

Students of the establishments of higher education are freshmen sophomores, juniors and seniors. A freshman is a first-year student, a sophomore - a second-year student, a junior - a third-year student and a senior - a fourth-year student. Sometimes a few students who show great progress in their studies obtain grants. They take part in the development of scientific or technical problems.

Most American college trained students go into business² or industry.

Notes

1. grade - класс (в американской школе)
2. to go into business - заниматься коммерческой деятельностью

Unit 5

Text A

CAMBRIDGE

Cambridge is situated at a distance of 70 miles from London; the greater part of the town lies on the left bank of the river Cam crossed by several bridges.

Cambridge is one of the loveliest towns of England, it is not a modern industrial city and looks much more like a country town.

It is very green presenting to a visitor a series of beautiful groupings of architecture, trees, gardens, lawns and bridges. The main building material is stone having a pinkish colour which adds life and warmth to the picture at all seasons of the year. The dominating factor in Cambridge is its world-known University, a centre of education and learning, closely connected with the life and thought of Great Britain. Newton, Byron, Darwin, Rutherford and many other scientists and writers were educated at Cambridge. In Cambridge everything centers on the University and its colleges, the eldest of which was founded in 1284. They are 27 in number. There is a close connection between the University and colleges, though they are quite separate in theory and practice.

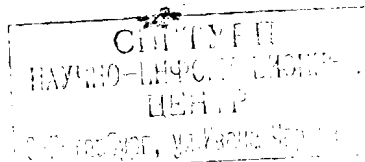
A college is a place where you live no matter what profession you are trained for: so that students studying literature and those trained for physics may belong to one and the same college.

However the fact is that you are to be a member of a college in order to be a member of the University.

Every college is headed by a dean. Discipline is looked after by Proctors and numerous minor officials called bulldogs.

If you are undisciplined you are fined or you may be "gated", that is not allowed to go out of college gate.

In some cases you are expelled for a given period of time. A college is a group of buildings forming a square with a green lawn in the centre. An old tradition does not allow the students to walk on the grass: this is the privilege of professors and head-students only.



There is another tradition which the students are to follow: after sunset they are not allowed to go out without wearing a black cap and a black cloak.

The University existed before the colleges. It has the power to grant degrees, it defines courses of study, and organizes most of the formal teaching.

The various subjects of study are controlled by a series of faculties and the teaching is provided by professors, readers and lecturers.

The University trains about 7,000 students in different specialities.

You study at the University for 4 years, 3 terms a year. The long vacation lasts 3 months. You are trained by a tutor; each tutor has 10-12 students reading under his guidance. There are many libraries at Cambridge; some of them have rare collections of books. In one of them among the earliest books by Shakespeare and other great writers one may see an early description of Russia by an Englishman on diplomatic service there (1591) and a Russian reading book of the seventeenth century.

Notes

Bulldog - «бульдог» (в Оксфордском и Кембриджском университетах помощник инспектора сопровождает последнего во время обхода университета)
Cloak - плащ, мантия
College - университетский колледж
Cap - шапка, фуражка
Course - курс
Dean - декан
Degree - звание, ученая степень
Description - описание
Exclude - исключать
Fine - штрафовать
Grant - дарить, жаловать

Guidance - руководство
Lawn - лужайка, газон
Lovely - красивый
Look after - следить, заботиться
Merely - только, просто
Minor - второстепенный
Official - служебное или должностное лицо
Pinkish - розоватый
Privilege - привилегия
Proctor - проктор, инспектор студентов
Rare - редкий
Term - семестр
Tutor - руководитель
Vacation - каникулы

Text B

LONDON

London is the capital of Great Britain. It is the largest city of Britain. The first mayor¹ of London was elected in

1193 but more than a thousand years before that London was a place of importance and then with the passing years London grew in importance and became the seat of the government.

London survived the Plague² which killed nearly 100,000 people and the Great Fire (1616) which followed. Little damage occurred during World War I, but World War II brought tremendous destructions. Many buildings of great historic value were laid in ruins and today the face of London has changed.

Actually there are several Londons. First there is the City of London. It is about one square mile in area but it contains the Bank of England, the Stock Exchange³ and the headquarters of many companies and corporations. It is the financial and business centre of Great Britain. During the day the City has a population of half a million, during the night its population isn't much more than 5 thousand.

There is the West End which is famous for all the historical palaces, beautiful buildings, fine parks, fashionable shopping centers, hotels and restaurants. It is here in the West End that most colleges and schools and the University of London are centred.

Trafalgar Square is often mentioned in the press as a place where mass meetings are held.

Working class of London is centered in the East End. It is a vast area running eastward from the City. It includes all the dock areas and is heavily industrialized. It is in the East End that most plants and factories are situated. There are miles of poor houses and many slums in the East End. It is mostly an industrial part of London. Mention must be made that not all the workers have a steady job.

It is quite impossible in a few days or even in weeks to see all that London can offer.

London's river, the Thames, provides an interesting picture for sightseers.⁴ Tower Bridge is of great interest. It was built in 1834. Its upper span is 150 ft. For many years the Tower was a royal residence, as well as a state prison where many famous men and women were imprisoned.

The Houses of Parliament were erected a century ago and incorporate a part of the Palace of Westminster. The view from the river is particularly beautiful. The Clock-Tower which contains the hour-bell called Big Ben is known the world over. Mention must be made that this bell weighs 13,5 tons.

The historic building to which every visitor sooner or later is drawn is Westminster Abbey. It was founded in 1050. The present building dates from the time of Henry III who began to rebuild it, this work lasted nearly 3000 years. Westminster Abbey contains the memorials⁵ of many famous citizens of Britain.

The most important industries of London are metalworking, engineering and automobile making. The raw materials and fuel for the industrial plants are brought in through London port. Commercial ships carry electrical equipment, steel, textiles and other products to different countries.

Notes

1. mayor - мэр города
2. plague - чума
3. Stock Exchange - фондовая биржа
4. sightseer - осматривающей достопримечательности
5. memorial - памятник

Text C

LET US CONTINUE THE SIGHTSEEING OF LONDON

Sooner or later every visitor gets to Trafalgar Square with the monument to Lord Nelson. It is a beautiful column with the 17ft statue of Nelson. The total height of the monument is 184 ft. Trafalgar Square is often mentioned in the press as a place where mass meetings are held.

The paintings of famous Italian, Dutch and English masters are broadly represented in the National Gallery facing the Square.

London is particularly rich in varied architectural styles. The Royal Standard flying over Buckingham Palace is the sign that the Queen is in residence. Since 1837 it has been continuously used as the official residence of the kings.

Hyde Park is the largest and most popular of the London parks. It originally belonged to the Abbey of Westminster. There is the area in the park where the Hyde Park speakers of all types declare their various opinions.

Sir Christopher Wren, the famous English architect, designed many of the buildings that were erected in the City after the Great Fire of London. The most magnificent of his churches is St. Paul's Cathedral. It was built between 1675 and 1710 to replace the old Cathedral that was largely destroyed in the Great Fire. St. Paul's Cathedral is a beautiful sight standing out among the other buildings. When Wren died he was buried in the Cathedral he had planned and his son wrote the following words in Latin: "If you want to see his monument look around".

Fleet Street is known all over the world as the home of British journalism.

Unit 6

Text A

GREAT BRITAIN

The British Isles consist of Great Britain (England, Wales and Scotland), Ireland and many small islands. The total area is about 120,000 square miles, i.e. one thirtieth of the size

of Europe. In the British Isles, 54 million people live in an area of 120,000 square miles. The average density of population, some 440 per square mile, is very high.

Mountains are an important feature of the geography of the country; their position largely determines the direction, length and character of the rivers.

The British Isles are well-provided with rivers, but from the point of view of transport, their insignificant size (the longest river is only 1/20 of the length of the Amazon) prevents them from being navigable for ocean-going ships.

The outstanding features of the climate of Britain are its humidity, its mildness, and its variability. These characteristics are due to the fact that the prevailing winds blow from the south-west. As these winds blow from the ocean, they are mild in winter and cool in summer and are heavily charged with moisture at all times.

As far as temperature is concerned, Britain is famous for having warmer winters than any other place in the same latitude. Another remarkable feature of the climate of Britain is that temperature decreases not from south to north, but from east to west.

What about the industry of Great Britain?

Coal has been known in Great Britain for many centuries, but it is only during the last hundred years that it has been mined on a large scale. The coal-mining industry of Great Britain has been nationalized since 1947, the generation of electric power since 1948 and the manufacture of gas since 1949.

The raw materials of the industry - coal, ore and limestone are bulky and their producing areas are highly localized, British ores are largely of low iron content. The non-ferrous metals, though less bulky, are essential to the steel and engineering industries.

Of the goods exported and imported by Great Britain more than half go through the two ports of London and Liverpool. They are followed by Manchester, Glasgow and Dover.

London was originally a little Celtic settlement named Lyndin. When Edward the Confessor¹ had founded Westminster Abbey, in the closing years of the 10th century or early 11th century, William the Conqueror² moved his court from Manchester to London, It was in 1066, and London has been a capital ever since.

Great Britain is a monarchy. However the power of the Queen of Great Britain is limited by Parliament. It consists of the House of Lords³ and the House of Commons.⁴ The Prime Minister is usually the leader of the Party that has a majority in Parliament.

Notes

1. Edward the Confessor - Эдвард Исповедник, английский король (1004 - 1066)

2. William the Conqueror - Вильгельм Завоеватель, получивший английский престол после завоевания Англии норманнами в 1066 году
3. The House of Lords - палата лордов
4. The House of Commons - палата общин

Text B

BERNARD SHAW

July 26, 1956 is the date of the centenary of George Bernard Shaw's birth. Bernard Shaw was a realistic writer who was always on the side of advanced ideas and loved people with great warmth.

Shaw was born in Dublin, on 26th of July 1856 of a middleclass family. He attended school which he hated and which he remembered as a "boy prison". He went to school as a "day boy" which meant that he had his afternoons free. Shaw used to say that he had wasted his time at school as it had not taught him anything. And at home there was music - always music. His mother had a beautiful voice, he himself and his sisters could sing well enough, and there were, besides the piano, many other musical instruments always lying about. The front sitting-room was seldom silent in the evening, and music came to play an important educative part in young Shaw's life.

Suddenly a new figure appeared in the family - Mr. Lee, a professional music master. His appearance at Shaw's house was due to the fact that Mrs. Shaw had gone to him to have her voice trained. Since the day of his coming nothing counted except music. Young George Bernard took part in all the musical activities, though he had never been trained before.

By the time he was fifteen two important events had happened. Mrs. Shaw had gone to London where she decided to earn a living by teaching singing; George Bernard had finished his schooling and got his first job. The job he had been given was that of a clerk in an office. The world that the new clerk found there was to him as alarming as it was strange. The monotonous daily routine, the endless figures and forms, the feeling that he had become an insignificant part of a machine, all that alarmed the youth. In many things he was better informed than most of his fellow clerks. Shakespeare, Byron, Shelley and many other great poets and writers had been read and re-read by him. He could discuss art, for he had studied the best works at the Ireland National Gallery, which even then was one of the world important collections. And when it came to music he could, of course, leave them all far behind. At his job he was quite efficient and his starting salary had increased by the time he was nineteen to 80 a year. He had mastered the problems of his work without any difficulty. Yet he was far from being happy. Though the office was not such a "prison" as his school, but a prison it was for all that. Shaw felt that he had to leave. So in 1876 he said good-bye to Ire-

land and went to London where he became a journalist and wrote music and dramatic critiques for various periodicals.

George Bernard Shaw started his literary work with a few novels which had little success and in 1892 turned to dramatic writing. Shaw had an easy command of wit in all its forms. In his works he exposes the capitalist society and his exposure is very significant and places him among the most important representatives of critical realism in modern English literature.

Bernard Shaw loved the Russian realistic drama and with a few English writers and actors of his time brought the plays by Chekhov, Gorky and Tolstoy onto the English stage.

In his old age Shaw visited the Soviet Union.

His plays are always a success in our country. In 1955 "Pygmalion" was staged over 200 times.

George Bernard Shaw is widely popular and beloved in Russia.

Notes

1. to be born - родиться
2. to earn a living - зарабатывать на жизнь
3. 80 a year = 80 pounds a year - 80 фунтов стерлингов в год
4. for all that - тем не менее, несмотря на все это
5. had an easy command of wit - обладал остроумием
6. to be a success - пользоваться успехом

Unit 7

Text A

MEASURING TIME

If two alternating current generators are coupled together to carry a load, they run at exactly the same speed if they have the same number of magnetic poles.

If one of them makes 90,000 revolutions per hour then the other one will make 90,000 revolutions in the same time, neither more nor less. They work as if they were geared together. If the load were transferred to one machine the other would continue to run and if we no longer drove the second machine, the first would continue to drive it as a motor. Those two machines would continue to run in step so long as they are connected together unless the rotation were resisted by excessive force. We say that the machines are "in synchronism" if they are in step with one another.

On a large electrical system all the synchronous motors must run uniformly at synchronous speed. Even if they ran at different speeds, the speeds would be in an exact ratio, and a six-pole machine would turn at precisely two-thirds of the speed of a four-pole one.

It was realized years ago that if the frequency of the supply were controlled carefully, the synchronous motors could

be used as clocks. The next obvious thought was naturally that if the frequency were so controlled, the clocks could be fitted with little synchronous motors. Today we consider the electric clock, driven from the supply by means of a tiny synchronous motor quite an ordinary thing.

But suppose we were in a small country town of England some time before 1830. At that time there was a town clock, and most of the townspeople had clocks in their houses and even carried fine watches. These were mechanisms of great accuracy; still they lost and gained time and had to be reset from time to time, but reset to what?

Had the telegraph existed at that time it would have been easy to know the time. If the radio had been invented it would have informed you of the exact hour. Had the telephone been in everyday use you could have inquired and got a ready answer. But there were no radio-sets, no telephone, nor even a telegraph. You could reset your clock by direct observation of the sun or by a sun-dial. However, the time given by a sun-dial does not keep in step with the time given by a clock, as the sun-dial shows the time proper to the place where you live.

When the railways had been invented, an idea was put forth in 1841 - to use the electric telegraph to transmit time for clock-setting purposes.

With the development of atomic energy it has become possible to measure time by means of an atomic clock. It is extremely accurate. The scientists say: "If an atomic clock had been set at the beginning of our era it would have lost or gained not more than half of a second by now."

Notes

1. alternating current - переменный ток
2. to carry a load - нести нагрузку
3. per hour - в час
4. as if - как если бы, как будто бы
5. no longer - больше не
6. they (watches and clocks) lost and gained time - они (часы) отставали и спешили
7. a ready answer - быстрый ответ

Text B

SOME FACTS ABOUT HEAVENLY BODIES

Since the time Galileo made the first telescope, hundreds of scientists the world over¹ have devoted their lives to the study of stars.

To us who inhabit the Earth the Sun is the most important of all heavenly bodies of our solar system. Without the Sun there would be no light, no heat, no energy of any kind.

The surface temperature of the Sun is about $10,000^{\circ}\text{F}^2$, in the interior of the Sun the temperatures are much higher, rising to $30,000,000^{\circ}\text{F}$. Much of the radiation from the Sun is absorbed by the atmosphere before it reaches the Earth's surface. If we calculated the total energy radiated by the Sun in all directions, we would obtain the figure $4,10^{33}$ ergs per second. This figure shows that provided all the energy radiated by the Sun could be used to heat the oceans of the Earth, the temperature would rise from freezing point to boiling point in less than two seconds!

There can be no question of anything living on that surface. Even were it cool enough, structures like our bodies would not be able to move along it. A 145lb.⁹ man would weigh there about two tons. He would be smashed by his own weight.

Not only does the Sun radiate energy at a steady rate, but it also holds the Earth at a more or less constant distance. If the Sun's activity were not so steady, life on the Earth would soon cease.

Scientists consider that life has existed on the Earth for more than 500 million years. During all this time the solar constant couldn't have changed greatly, because had it become either twice as large or half as large as it is now, then life would have ceased! Both the solar distance and the Sun's rate of generation of radiation must have varied little over this period of time.

The planet Earth is not quite a sphere,⁵ but is slightly flattened. It rotates around its axis once a day and around the Sun once a year.

The Earth is protected by the atmosphere. But for⁶ the atmosphere we should die. It provides us with oxygen and water, protects us from harmful effects of radiation from the Sun.

The Moon is not very far from us. There is no atmosphere on the Moon. Because of the absence of the atmosphere the temperature changes there are very great. For example, if one moved a few yards from sunlight to shadow, the temperature would fall 400°F in a matter of seconds.⁷

On the surface of the Moon gravity is only one-sixth of that on the Earth, therefore we would not weigh so much there.

A man weighing 120lb. would weigh only 20lb. there: he could be carried by a child!

Notes

1. the world over - во всем мире
2. 10000°F (F - Fahrenheit) - $10,000^{\circ}$ по шкале Фаренгейта = примерно 5520 по шкале Цельсия. $30,000,000^{\circ}\text{F}$ = примерно 16,540,000 по шкале Цельсия.
3. $4,10^{33}$ читается four times ten to the thirty-third power, или four multiplied by ten to the thirty-third power

4. 145lb. (lb. - лат. Libra) читается 145 pounds (1 pound = 453,6 gr.)
5. sphere - шар
6. but for ... - если бы не ...
7. in a matter of seconds - через несколько секунд

Unit 8

Text A

NEWTON AND THE PROBLEM OF GRAVITATION

Newton was born in 1642. His father died before his son's birth. When Newton was fifteen, his uncle removed him from school, planning to make a farmer of him. However, finding that he made a poor farmer, the uncle sent him back to school and then to the University of Cambridge, where later on he lectured on mathematics for more than 30 years. Newton soon distinguished himself in mathematics, having made a number of important contributions to that science by the time he was twenty one.

In 1665 the great plague broke out in England and Cambridge closed its doors.

Newton was obliged to return home, and it was there in the following year that observing the fall of an apple from a tree, he came to the conclusion that the force keeping the planets in their orbits around the sun was the same force that caused the apple to fall, namely, the force of gravity. He wanted to know if gravity was the cause of the motion of the moon. However, his calculations showed that it was not. What Newton did not know was that the then accepted figure for the distance from the earth to the moon was wrong. He put the problem aside.

Six years passed by. In 1672 more accurate calculations were made making it possible to establish the true size of the earth. From these it was possible to establish the true distance to the moon. Newton's interest in the subject of gravitation being revived, he started a new set of calculations devoting all his time to the subject for two years.

His interest was so great that he forgot everything else. Sitting half dressed on his bed he remained there in thought all day long eating only when food was brought to him and not noticing what he was eating.

The first part of his "Principia" was finished, but he put off publishing it. Instead, he locked it in his desk having decided to keep it there until after his death.

However, other scientists began to take interest in the subject of gravitation. Astronomers, physicists and other people talked about it at their meetings in London. Wren, the famous architect, offered a prize to either scientist who could prove why the path of a planet must be an ellipse. But neither could do it. In 1684 Halley, the astronomer, visiting New

НАУЧНО-ИНФОРМАЦИОННЫЙ ЦЕНТР САНКТ-ПЕТЕРБУРГСКОГО ГОСУДАРСТВЕННОГО ТЕХНОЛОГИЧЕСКОГО УНИВЕРСИТЕТА РАСТИТЕЛЬНЫХ ПОЛИМЕРОВ

at Cambridge asked him if he could solve the problem Newton said he had already got the answer. And so the great "Principia" was given the great "Principia" was given to the world, Newton having laid down in it the law of universal gravitation. This state that every particle of matter in the universe attracts every other with a force which is proportional to the product of their masses and inversely proportional to the square of the distance between them.

Newton then proceeded to show that the laws of the planets were the natural results of universal gravitation. He proved mathematically that the planets had to move just as they did. He showed further how the mass of the sun could be calculated from the speed and distance of any planet.

Notes

1. to make a poor farmer - быть плохим фермером
2. to distinguish oneself - выделиться, отличиться
3. to lay down the law - устанавливать, формулировать закон
4. now ... now - то ... то
5. the "Principia" - «Начала»

Text B

ABC¹ OF LASERS AND MASERS

A new field of electronics showing promise includes the group of devices that are controlled by electromagnetic radiation at the atomic level. Based on knowledge of atomic structures, these new devices are being developed at a rapid pace.

Quantum electronics gets its name from the bundles or packets of energy which affect the energy level of the atom, the quantum theory being the basis for the development of the following devices.

The maser from the initial Microwave Amplification by Stimulated Emission of Radiation was the first of the quantum electronic devices. Atoms of specific material are given energy to change their orbital states. This external energy affecting enough atoms, the stored energy can be triggered² by a weak signal so that the atoms give off R-F³ energy at a frequency that is identical to the applied signal.

An early model worked with ammonia gas, but since that time both solid state and gas masers have been produced. Many masers are operated at room temperature while others are cooled to low temperatures for improved operations.

The maser led to the optical maser or laser (Light Amplification by Stimulated Emission of Radiation). The laser promises to outstep the maser in importance. The summer of 1960 saw the world's first demonstration of an entirely new source of light which on the one hand is so concentrated and powerful that it can produce power densities billions of times as intense as those on the surface of the sun, and on the other

hand can be controlled so precisely that surgeons use it to perform very delicate operations on the human eye.

The laser has become an important electrooptical development with wide potential uses. As a new electronic device it has important applications in space communications, materials research, atomic physics, etc. Lasers have four essential features which make them useful for a wide variety of applications. First, the laser has an extremely high power. Secondly, the laser produces an extremely high-frequency radio-like coherent⁴ signal. The third feature is that the laser produces a very narrow beam of energy. And fourth, it has an extremely small spot focus. On the one hand the laser beam can burn holes in steel plates and on the other hand it can set carbon on fire. Besides that it has many dramatic features other than its power. It spreads out so little that if it were sent from the earth to the moon it would illuminate an area of the moon's surface only two miles in diameter. It is very "pure", all light in it being of the same wave-length. It is coherent, which means that all the light waves in the beam are exactly in phase with each other. These last two properties mean a great deal to scientists and engineers, they being very important for the technological progress.

Notes

1. ABC - основы
2. (it) can be triggered - (ее) можно привести в действие
3. R-F = radio-frequency - радиочастота
4. coherent - когерентный, связанный

Unit 9 Text A

ULTRASONICS

We distinguish audible and inaudible sounds, that is, sounds that can be heard and sounds that cannot be detected by the human ear. The former are called sonic, the latter ultrasonic sounds. The range of sounds audible to the human ear is from 20 to 20,000 vibrations per second.

The source of the ultrasonic sound is called a transducer. One of the transducers is a quartz crystal. This is a solid body whose property is to change its dimensions under the influence of electricity.

High-frequency sound offers a convenient means to produce pulsed signals. These signals have been used to perform different kinds of work, such as to mix liquids, to detect various defects in a metal and many others.

A quartz crystal is pressed against the surface of the metal to be tested. An electric current of ultrasonic fre-

quency is applied to the crystal to make it vibrate with the same frequency. From the crystal a short burst of sound travels into the specimen. If it comes across an air bubble, a crack or some other defect it is reflected from that region, thus locating the defect. If the specimen has no defects the signal is not reflected back until it reaches the opposite surface of the specimen.

Ultrasonic method is applied to study the ocean bottom, to locate shoals of fish or to detect some danger to navigation. People might have avoided many accidents if ultrasonic methods had been known before. However the early wish to detect icebergs by ultrasonic equipment failed to be realized. The reason for the failure is to be explained by the following acoustic fundamentals - water and ice have nearly the same density, sound travelling at nearly the same speed through both. Thus a sound wave passes freely from one medium into the other with only a small amount of reflection.

Ultrasonic waves are used in various industries. Ultrasonic cleaning promises to revolutionize the washing of metal parts. Various machine parts can now be washed cleaner than they could have been washed by all the known methods before. Besides the washing is done at a lower cost and in much less time. It is sufficient to put them into an appropriate solvent while agitating the solvent at quartz crystal frequency.

Ultrasonic cleaning proves to be especially successful in treating metal parts of irregular shape. The cracks which are inaccessible to cleaning by all the usual methods come out clean when treated by ultrasonics.

To clean by ultrasonics seems to be very simple. But a physicist knows that in attempting to explain this "simple" process of ultrasonic cleaning he has to go into the fundamentals of acoustics and thermodynamics.

Notes

1. to come across - натолкнуться, встретить
2. is done at a lower cost - обходится дешевле
3. proves to be - оказывается

Text B

PRINCIPLES OF MODERN RADAR

Modern radar has advanced far beyond the heavy equipment of short range and limited accuracy that appeared as one of the major technical achievements after World War II.

Through continuous improvement it has been possible to increase the range of modern radar to global and even outer-space distances. Accuracy having been infinitely improved through increased use of microwaves and the development of

electron tubes capable of handling such wavelengths, the usefulness of radar has been considerably expanded.

Radar has many peaceful uses. To help navigation at sea, small radars are installed on small commercial vessels, and larger setups are used on ocean-going liners and transports.

Aboard aircraft radar is used to make air navigation and flight safe, and to map areas over which the plane is flying. Ground-based radar is employed to control flights of aircraft.

In detecting storms, radar can locate heavy clouds associated with various weather disturbances.

Whatever the application, the basic principles of all types of radar equipment are deeply rooted in radio and electronics.

A radar (an abbreviation of radio detection and ranging) is a composite radio-electronic apparatus to be used for detecting and locating objects and targets, such as aircraft, ships, buildings, mountains, and even people at various distances and with incredible accuracy, even when darkness, fog or clouds make the targets invisible.

To determine the exact location of any target is made possible through accurate measurements of range, altitude, and azimuth, whether the target is in space, on the ground or on the sea. The data obtained (directly or through electronic processing) are displayed continuously on an indicator. This is usually a cathode-ray tube, the type of which is dependent on the kind of data to be displayed - range, altitude, azimuth, or other.

Notes

ocean-going - океанский

ground-based radar - наземная радиолокационная станция

are deeply rooted in radio - глубоко заложены в радио

essentially - в основном, в сущности

electronically - на электронной вычислительной машине

through electronic processing - с помощью обработки на электронной вычислительной машине

cathode-ray tube - электронно-лучевая трубка

Unit 10

Text A

INDUSTRIAL ELECTRONICS

Industrial electronic equipment is known to play a very important role today.

Hundreds of electronic devices are now available to science and various industries to help do jobs better or more economically or to take over jobs that could not be done otherwise.

The application, use, and proper maintenance of many electronic devices now in industrial use demand a certain

knowledge to be had of the fundamentals of various standard electronic equipment.

We already know that in motors, incandescent lamps, transformers, etc., the electricity always flows in the copper wire or other metal parts. But consider lightning, where electricity seems to jump through space. The great electric pressure of lightning forces the electric current to pass through the air. In the same way, inside any radio tube, tiny electric currents are made to pass through the space separating certain parts in the tube. Such action - where electricity appears to flow through space instead of being confined to metal conductors or circuits - is said to be electronic.

Why is it called electronic? Years ago, scientists who were trying to explain how electricity passed through space, imagined such an electric current to be a steady stream of tiny electrical particles. They called these particles electrons. Today, any electric current is believed to consist of countless numbers of electrons. For a device to be called electronic, electricity must flow across the space inside the device and be controlled by that device.

In ordinary air, electrons can be made to jump through space only by pressure of high voltage. But if enclosed in a tube from which the air has been removed, the electrons flow across the space more easily. All tubes must be carefully sealed for the desired conditions to be maintained inside the tube. Most small tubes are vacuum tubes, the larger ones usually containing mercury or other vapour.

Some electric lights are electronic. The common incandescent light bulb is not considered to be electronic even though it is enclosed like a radio tube, for the electric current flows entirely within the metal filament. In contrast, the fluorescent lamp is electronic, its light being produced by the action of electric current flowing through the space between the two ends of the lamp.

Electronics as a science is not new, for radios, sound pictures, fluorescent lights, etc. are known to depend upon electronics. However, the recent developments based on electronics require a better understanding of the subject in general.

Notes

A comparative newcomer -
появившись сравнительно не-
давно

Has been directly responsible
for saving - дало непо-
средственную экономию

Are now available to science
- находятся теперь в распо-
ряжении ученых

To take over jobs выполнять
работы

Now in industrial use - ко-
торые применяются в промыш-
ленности

Demand a certain knowledge
to be had of the fundamen-
tals - требуют определенных
знаний основ

Seems to jump through space
- как бы проскакивает в про-
странстве

In the same way - точно так же
Appears to flow through space - как бы течет в пространстве

Years ago - много лет тому назад
Comes out of the metal into the open - выходит из металла в окружающее пространство
In contrast - наоборот

Peter and Paul Fortress.

Fortress	Крепость
Protect	Защищать
Awful	Ужасный
Prison	Тюрьма
Participant	Участник
Uprising	Восстание
Cathedral	Собор
To the design	По проекту
Spire	Шпиль
Structure	Сооружение
Tower	Башня
Tomb	Надгробный памятник
bury	Хоронить

The building of our town began in 1703 with the foundation of the Peter and Paul Fortress on Zayachy Island in the Neva River Delta. It was built to protect Russia from the attacks of the Swedes. But very soon the fortress lost its military importance and became one of the most awful in tsarist Russia political prisons. Among the prisoners of the fortress were A Radichev, Dostoyevski, Chernishevsky, the participants of the Decembust uprising of 1825, M.Gorky and many others.

In 1905 Maxim Gorky was imprisoned here for writing a revolutionary proclamation.

In 1924 the Peter and Paul Fortress was opened as a museum. The museum consists of two main parts: the prison and Peter and Paul Cathedral.

The Cathedral was built to the design of Domenico Trezzini (Доменико Трезини) in 1733. For a long time the cathedral with its spire (122,5 metres high) was the highest structure of the city. (Now the highest structure is the TV tower - 316 m high). Inside the cathedral you can see Peter the Great's tomb. Nearly all the Russian tsars from Peter the Great were buried in the cathedral.

The Hermitage

Hermitage
Architect

Эрмитаж
Архитектор

Interior
Accessible
Number
Work of art
Represent
comprise

Интерьер
Доступный
Насчитывать
Произведение искусства
представлять
Включать

Leningrad is widely known as a large cultural centre. There are more than 160 museums in our town. The Largest museum in Russia and one of the world's leading art museums is the State Hermitage. It consists of 5 buildings: the oldest building is the Winter Palace built in the 18th century to the design of the famous architect Bartolomeo Rastrelli. But the interior of the Palace was reconstructed several times by Quarenghi (Кваренги), Stasov, Rossi, Monferrand, Stasov, and Al. Bryullov. Before 1917 the Winter Palace was the residence of the Russian tsars. The next building is the Small Hermitage by Vallin de la Mothe (Валлен-Деламот). The other buildings are: the old Hermitage by the architect Yuri Veldten (Фельтен), the Hermitage Theatre by G. Quarenghi (Кваренги) and the New Hermitage built to the design of Leo Klenze (Лео Клензе) by the architect Yefimov. The building faces Millionnaya Street.

At present the collections of the Hermitage number about 300,000,000 works of art representing different ages, countries and schools. Over 350 rooms are open to the public. World famous is the collection of West-European paintings, comprising works by Leonardo da Vinci, Raphael, Titian, El Greco, Velazques, Murillo, Rembrandt, Van Dyck, Rubens, the works by French Impressionists and Post-Impressionists. The collection illustrates the art of Italy, Spain, Holland, Belgium, Germany, France, Britain, and many other countries.

NEVSKY AVENUE

St. Petersburg's main street is Nevsky Avenue. It takes its name from the Alexander Nevsky Lavra. The Avenue is about four and a half kilometres long and in places is up to 60 metres wide. It is one of the oldest streets in our city.

In Nevsky (as we call it) and the squares adjoining it one can see many beautiful palaces, libraries, museums, theatres, higher educational establishments, research institutes, and department stores built by famous architects.

The Avenue begins from the Admiralty, the architectural centre of the city. It was built by the architect Zakharov in 1823.

The Admiralty with its golden spire is a symbol of St. Petersburg. You can see it on the medal "For the defence of Leningrad" during the 900 days of blockade.

One of the most beautiful architectural monuments of the Avenue is Kazan Cathedral built by the outstanding Russian architect Andrei Voronikhin between 1901 and 1811. With it's fine semicircle of 144 columns the cathedral plays an important part in the architectural appearance of Nevsky.

It was the time of the Russian-Napoleonic war and the cathedral became a memorial of the Patriotic War of 1812. The cathedral holds the tomb of Field-Marshal Kutuzov. On the square before the cathedral there are two monuments by the sculptor Orlovsky: to M.Kutuzov and M.Barclay de Tolly under whose command the Russian Armies fought Napoleon.

Adjoin	Примыкать
Golden spire	Золоченый шпиль
Symbol	Символ
Defence	Оборона
Column	Колонна
Appearance	Облик
Memorial	Памятник
Tomb	Надгробие, место захоронения
Admiralty semicircle	Адмиралтейство Полукруг

OSTROVSKY SQUARE

1. One of the most impressive buildings in Ostrovsky Square is the Pushkin Drama Theatre built by Carlo Rossi in 1832 in classic style. The building of the theatre looks like a temple of the arts. It is one of the oldest theatres in our country. It played an outstanding role in the social life of the country by staging progressive Russian drama. Great actors of the 19th and 20th centuries performed at this theatre: Asenkova, Davydov, Varlamov, Strepetova, Kommisarzhenskaya, Savina, Yuriev, Cherkassov, Simonov and others.
2. The National Library...
It consists of two buildings. One of them is the work of E.Sokolov, and stands on the corner of Nevsky Avenue and Sadovaya Street. It was built in 1801. The second building facing Ostrovsky square was erected by Carlo Rossi in 1832. It is decorated with bas-reliefs of ancient philosophers, writers and orators, and by statue of Minerva, the goddess of wisdom. The library is one of the largest in the world. There are more than 20,000,000 books, manuscripts, periodicals, and maps here. Among its readers were L.Tolstoi, Pirogov, Sechenov, Mendelejev, Pavlov, Gorky, Lenin and many other famous people of Russia.
3. In the middle of the Square one can see the monument to Catherine II erected in 1873 by the artist Mikeshin, and

sculptors Opekushin and Chizhov. On its round pedestal we see bronze statues of the famous statesmen of the 18th century: Potemkin-Tavrichesky, Suvorov, Rumyantsev-Zadunaisky, Dashkova, President of two Russian Academies, the poet Derzhavin and others.

4. One of the most beautiful streets is Arcitect Possi Street. It is remarkable for its proportions. It is 22 meters wide, the buildings are 22 meters high, while the length of the street is 22 meters. One of the buildings houses the Leningrad Choreography School which bears the name of outstanding ballerine A.Vaganova, who taught here. Among the pupils of the school were Anna Pavlova, W.Nijinsky, N.Fokin, and G.Ulanova.

Impressive	Впечатляющий
Temple	Храм
Perform	Играть
Face	Выходить фасадом
Bas-relief	Барельеф
Bust	Бюст
Ancient	Древний
Orator	Оратор
Goddess	Богиня
Wisdom	Мудрость
Manuscript	Рукопись
Periodical	Периодическое издание
Pedestal	Пьедестал
Statue	Статуя
Statesman	Государственный деятель
Proportion	Пропорция
choreography	хореография

ARTS SQUARE

This square is a remarkable architectural ensemble as all the buildings here were built to the design of Carlo Rossi.

Arts Square is one of the most important cultural centers of St.Petersburg. On the square one can see three museums, three theatres, among which there is the State Russian Museum, the Maly Opera House and the St.Petersburg State Philharmonic which bears the name of the great composer Dmitry Shostakovich.

1. One of the first buildings of the square and the architectural centre of it was Mikhailovsky palace built by Rossi in 1812-1825. It is one of the best monuments of Russian classicism. In 1898 the Russian Museum was opened in the Palace. Now it is the second largest museum after the Her-

- mitage in St.Petersburg. Its collection numbers over 300,000 paintings, sculptures and works of applied art. Among its exhibits are the works by Andrei Rublyev, Rokotov, Borovikovsky, Kozlovsky, Shubin, Martos, Kiprensky, Ivanov, Bryullov, Repin, Levitan, Surikov, Serov, Nesterov and by many other Russian painters and sculptors.
2. The Maly Opera House was built in 1833 by the architect A.Bryullov (the facade to Rosssi's design).
 3. The St.Petersburg State Philharmonic was built in 1834-39 by Jacquot (Жако) also to Rossi's design. Many outstanding musicians played here: P.Tchaikovsky, A.Rubinstein, R.Vagner and many others. The symphony orchestra conducted by Yev.Mravinsky is known all over the world. It visited America, all European and many Asian countries.
 4. Next to the Philharmonic there is the Musical Comedy Theatre. This theatre remained in besieged Leningrad and didn't stop its activity.
 5. In 1957, a monument to Alexander Pushkin, the great Russian poet, was erected in the center of Arts Square (the sculptor M.Anikushin).

Remarkable	Замечательный
Ensemble	Ансамбль
Erect	Строить, возводить
Philharmonic	Филармония
Number	Насчитывать
Applied art	Прикладное искусство
Exhibit	Экспонат
Facade	Фасад
Correspond to	Соответствовать
Stage	Ставить спектакль
Ballet	Балет
Musician	Музыкант, композитор
Symphony	Симфония
Orchestra	Оркестр
Remain	Оставаться
besieged	осажденный

PALACE SQUARE

Palace Square is the main square in St.Petersburg. It is one of the world's most interesting architectural ensembles. The buildings here were erected by different architects at different time, but all of them represent a complete architectural unit.

The oldest building here is the Winter Palace built by B.Rastrelli in 1754 - 1762 in Russian baroque style. The Palace building is nearly two kilometres long in perimeter and has over 1000 rooms. It is the former residence of Russian tsars. Now the palace is one of the buildings of the State Hermitage Museum.

Opposite it we see the so-called General staff in classical style by Carlo Rossi (1829). The semicircular building is the longest in Europe-about 600 metres. The crowning point of the composition is the victory chariot on top of the arch (16 m wide and 10 m high) designed by the sculptors S.Pimenov and V.Demut-Malinovsky who for many years worked together with Rossi. This majestic building was erected as a monument to Russia's Victory in the Patriotic war of 1812 against Napoleon.

Another monument in honour of Russia's victory over Napoleon was the Triumphal Column erected in the centre of Palace Square in 1834 (architect A.Montferrand), called the Alexander Column. This is the highest granite monolith in the world. The column is 47,5 meters high. Its diameter is 3,66 metres. It is interesting to note that it is not fastened and stands entirely by its own weight, about 600 tons. The column is crowned with figure of an angel carrying a cross (sculptor B.Orlovsky). The pedestal is ornamented with haut relief whose theme is the glory of Russian arms.

DECEMBRISTS' SQUARE

One of the most beautiful squares of St.Petersburg is Decembrists' Square. It was named so in honour of the first Russian revolutionaries who on December 14, 1825 revolted against tsarism.

In the square one can see the best monument in St.Petersburg - the monument to Peter the Great. "The Bronze Horseman" as A.S.Pushkin called it. The monument was created by the French sculptor Falconet (Фальконе) and his pupil Marie Collot (Мари Колло). Peter the Great is shown as a statesman and great reformer. The monument is allegoric. The pedestal resembling a sea wave symbolizes Peter's struggle for the access to the sea. Peter's head is decorated with a laural wreath - a symbol of glory.

Falconet had another assistant, the Russian sculptor Gordeyev (Гордеев) who moulded the snake symbolizing reactionary forces which impeded the development of Russia. Besides, the snake is the third point of support.

From the square we see St.Isaac's Cathedral (by Montferrand - Монферран), The cathedral was named after St.Isaac because Peter the Great was born on his day.

It took 40 years (1818 - 1858) to build the cathedral. It is the third in height (101,5 m) among dome cathedrals of the world (after St.Peter's Cathedral in Rome and St.Paul's in London). Its golden dome can be seen from many points of the city. It accomodates 14000 people.

St.Isaac's Cathedral is richly decorated with 382 sculptures, mosaics and paintings by outstanding Russian artists K.Bryullov, Bruni, Vitali, Klodt and others.

Forty-three minerals were used for its building and decoration. In the cathedral the documents and materials on its construction and architecture are collected.

АНГЛИЙСКИЙ ЯЗЫК

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