

**МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ
РЕСПУБЛИКИ БЕЛАРУСЬ
УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ «ВИТЕБСКИЙ ГОСУДАРСТВЕННЫЙ
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КАФЕДРА ИНОСТРАННЫХ ЯЗЫКОВ**

Английский язык “Reader”

**Пособие по обучению чтению
студентов фармацевтического,
лечебного факультетов
и магистрантов**

Под редакцией Р.В. Кадушко

Рекомендовано Учебно-методическим объединением по медицинскому образованию в качестве пособия для студентов и магистрантов учреждений высшего образования, обучающихся по специальности 1-79 80 10 «Фармакология, клиническая фармакология»

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Пособие предназначено для студентов фармацевтического, лечебного факультетов и магистрантов (2-я ступень высшего образования). Оно построено по тематическому принципу, содержит текстовый материал по формированию различных навыков чтения (просмотрового, поискового, ознакомительного, изучающего). Данное пособие может быть использовано как для аудиторной, так и для самостоятельной работы студентов и магистрантов.

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Предисловие PREFACE

Основная цель данного учебно-методического пособия научить будущего специалиста в области медицины и фармации пользоваться аутентичной литературой на английском языке и заложить в ходе обучения всем видам чтения, предполагающим разную степень понимания прочитанного, основы для перехода к совершенствованию навыков устной речи. Предлагаемые тексты могут также служить материалом для обучения различным техническим приемам (для отработки механизмов чтения, перевода и т.д.).

В структурном плане пособие состоит из 6 разделов, а именно:

- From the history of medicine;
- From the history of botany;
- Great scientists;
- Alternative medicine;
- Nutrition. Vitamins and minerals. Medicines;
- Pathology. Treatment. Drug, alcohol and tobacco addiction.

Каждый из перечисленных разделов основной части учебно-методического пособия представлен текстами со специально отобранным лексическим минимумом и разработанными упражнениями для контроля понимания их содержания.

Учебно-методическое пособие включает также дополнительные тексты, которые можно использовать для управляемой самостоятельной работы студентов (перевод, аннотирование, реферирование, подготовка на их основе устных презентаций). Тексты учебно-методического пособия расширяют лексический запас по изучаемым темам. Они информативны, современны, подобраны из аутентичных источников.

Познавательная и профессиональная направленность языкового материала является стимулом к речевым действиям – воспроизведению текста и обсуждению с оценкой или комментариями прочитанного.

UNIT I. FROM THE HISTORY OF MEDICINE

THE BEGINNINGS OF EVOLUTIONARY PROCESS

The concept of disease is as old as the life itself. Since the beginning of mankind, there has been desire as well as need to know more about the causes and mechanisms of disease. The answers to these questions have evolved over the centuries – from supernatural beliefs to the present state of our knowledge of modern pathology. However, pathology is not separable from other multiple disciplines of medicine and owes its development to interaction and independence on advances in diverse neighbouring branches of science and strides made in medical technology.

From analysis of archeological evidence as well as myths and legends, it is clear that the treatment of health care problems in prehistoric times did not consist entirely of superstitious practices. Certainly early human societies used a variety of herbs and roots to alleviate the effects of disease and actively sought ways to relieve those in distress. Even crude surgery was attempted by early medical practitioners. For example, skulls with holes in them have been uncovered in various parts of Europe, Asia and South America. The holes were cut out of the bone with flint instruments to gain access to the brain. Although the rationale for these early operations is unknown, one can speculate. Perhaps they were performed because of medical or religious beliefs, for example, to liberate pain (as in the case of migraine) or attacks of falling to the ground (as in actually survived, in evident from the rounded edges on the bone surrounding survivors also achieved a special status of sanctity off convulsive attacks. From these beginnings the practice of medicine has evolved to become an integral part of all human societies and cultures.

1. alleviate – облегчить;
2. sought *past part.* от „seek“ – искать, разыскивать;
3. crude – незрелый, сырой, необработанный; грубый;
4. rationale – разумное объяснение;
5. speculate – делать предположение, размышлять;
6. to liberate – освобождать;
7. malicious demons – злобные демоны;
8. to survive – выживать;
9. status of sanctity – статус святого;
10. stride – успех, большой шаг;
11. superstitious – суеверный;
12. flint – кремневый

Exercise 1. Find the equivalents to the following words:

археологические свидетельства; первобытные человеческие общества; активно искать пути помочь больным; первые попытки хирургического вмешательства; доступ к мозгу; можно догадываться; магические и религиозные верования; крайне сильная боль; неотъемлемая часть культуры; быть обязанным своему развитию; достижения в различных смежных науках; смягчить следствие болезни; инструменты из кремния.

Exercise 2. Put into the order they meet in the text the following statements:

1. Skulls with holes were found out in various parts of Europe, Asia and South Africa.
2. Human societies in prehistoric times not only used herbs and roots to relieve pain, but also attempted crude surgery.
3. This procedure was carried out on living patients.
4. From the early times the practice of medicine has become an integral part of all human societies and cultures.
5. They made holes in skulls to gain access to brain.
6. These survivors achieved a status of sanctity.
7. The early crude operations on skulls were probably performed because of magical or religious beliefs.

Exercise 3. Mark the following statements as “True” or “False”:

1. It's clear from analysis of archeological evidence, myths and legends that practice of medicine in the early societies didn't consist only of superstitious practices.
2. Early men didn't use herbs and roots to alleviate the effects of disease.
3. Even complicated, high-qualified operations were performed by early medical practitioners.
4. Skulls with holes were uncovered in different parts of the world.
5. Everybody knows the rationale for these early operations.
6. The holes were made with flint instruments to reach the brain.
7. Making holes in the skull early men tried to ward off the malicious demons from skull.
8. They thought demons were the cause of severe pain.
9. The pieces of the skulls of the survivors weren't used any way.
10. Medicine has never been evolved to become an integral part of human culture.

Exercise 4. Answer the questions:

1. From what sources have we got to know about the treatment of health care problems in prehistoric times?
2. What did early men use to alleviate the effects of disease?
3. What kind of surgical practice did they attempt?
4. What can you say about the rationale for these early crude operations?
5. What evident proves that these operations were carried out on living patients and some of them survived?
6. What status did survivors achieve?

Exercise 5. Analyze the content of the text. Can you agree that medicine has become an integral part of human society from the very beginning of the evolutionary process? Prove it.

MEDICINE IN ANCIENT EGYPT

Magic and religion were part of everyday life in ancient Egypt. Gods and demons were thought to be responsible for many ailments, so often the treatments involved some supernatural element. Often priests and magicians were called on to treat disease instead of, or in addition to a physician. Physicians themselves often used incantations and magical ingredients as a part of their treatments. Since the belief in magic and religion was so commonplace in Egypt, it is though the use of magic and religion would have contributed to a powerful placebo effect. Since many medicines appeared to lack active ingredients, the perceived validity of the cure would have contributed to its effectiveness.

The impact of the emphasis on magic is seen in the selection of remedies, or the ingredients for those remedies. Ingredients were sometimes selected seemingly because they were derived from a substance, plant or animal that had characteristics which in some way corresponded to the symptoms of the patients. This is known as the principle of *simila similibus* (similar with similar) and is found throughout the history of medicine up to the modern practice of homeopathy. Thus an ostrich egg is included in the treatment of a broken skull, and an amulet portraying a hedgehog might be used against baldness.

Amulets in general were enormously popular with ancient Egyptians, being worn for many magical purposes. Health related amulets are classified as homopoeic, phylactic and theoforic. Homopoeic amulets portray an animal or a part of an animal from which the wearer hopes to assimilate positive attributes (like strength or speed). Phylactic amulets were protective, warding off harmful gods and demons.

The ancient Egyptian word for doctor is *swnw*. Here is a long history of *swnw* in ancient Egypt. There were many ranks and specializations in the *swnw*. Royalty had their own *swnw*, even their own specialists. There were inspectors of doctors, overseers and chief doctors. Known ancient Egyptian specialists are ophthalmologist, gastroenterologist, proctologist, dentist. Medical institutions are known to have been established in ancient Egypt since as early as the 1st Dynasty. By the time of the 19th Dynasty their employees enjoyed such benefits as medical insurance, pensions and sick leave. Employees worked 8 hours per day.

The Egyptians had a lot of knowledge about the anatomy of the human body even though they never dissected the body. For example, in the classic mummification process, they cleanly removed the brain out of the body via the nose using a long hook. The Egyptian physicians also were aware of the importance of the pulse, and of a connection between pulse and heart. Still, they were not able to distinguish between blood vessels, tendons, and nerves. Medical knowledge in ancient Egypt was so advanced that other kings and emperors from different empires would write to the Egyptian pharaoh to send them their best surgeon to perform operations.

Mostly the Egyptian physician's advice for staying healthy was to wash and shave the body, including under the arms. This would have worked because cleaning would prevent microbes and viruses. The physicians would also advise their patients to look after their diet, and avoid foods such as raw fish or other animals which would not be clean.

1. supernatural – сверхъестественный;
2. recourse – обращение за помощью;
3. to perceive – воспринимать, осознавать, замечать;
4. validity – ценность;
5. seemingly – на вид; по-видимому;
6. ostrich – страус;
7. hedgehog – ёж;
8. to portray – изображать; отражать;
9. to ward off – отражать, отвращать;
10. aware – знающий, сознающий;
11. deity – божество;
12. incantation – заклинание.

Exercise 1. Match the words with their definitions:

1. placebo	a) to execute a special surgical act;
2. amulet	b) cutting up of the body in order to study its structure;
3. phylactic	c) tough, thick cord, that joints muscle to bone;

4. sick leave	d) indifferent substance;
5. dissection	e) a document justified a temporary disability to work because of illness;
6. tendon	f) immune, prophylactic;
7. to perform an operation	g) thing, worn in the belief that it will protect (against evil, disease, etc.).

Exercise 2. Mark the following statements as “True” or “False”:

1. Magic and religion weren't a part of everyday life in ancient Egypt.
2. Priests and magicians were often called on to treat a disease instead of a physician.
3. The main principle of modern practice of homeopathy (simila similibus) was found in ancient Egypt.
4. The Egyptians had very little knowledge about the anatomy of the human body.
5. The Egyptians had no idea of the connection between the heart and pulse.
6. Egyptians' doctors advise to wash and shave the body for staying healthy.
7. Eating raw fish was considered to be a healthy eating habit in ancient Egypt.

Exercise 3. Arrange the statements logically as they appear in the text.

1. The ancient Egyptian word for doctor is swnw.
2. Mostly the Egyptian physician's advice for staying healthy was to wash and shave the body.
3. They were not able to distinguish between blood vessels, tendons, and nerves.
4. The Egyptians had a lot of knowledge about the anatomy of the human body.
5. Magic and religion were the part of everyday life in ancient Egypt.
6. Amulets were very popular, being used for many purposes.
7. The impact of the emphasis on magic is seen in the selection of remedies and ingredients for those remedies.

Exercise 4. Answer the questions:

1. Who were thought to be responsible for many ailments in ancient Egypt?
2. What did physicians usually use as a part of treatment?
3. In which way were the ingredients for remedies selected? What modern medical practice has the same principle in its basis?
4. What is the classification of all health related amulets? What were they used for?
5. Speak about Egyptian doctors. What ancient Egyptian specialists do you know?

6. What knowledge about the anatomy of the human body was spread in ancient Egypt?
7. In which way did they study the human body?
8. What did ancient Egyptian physicians advise for staying healthy? Can you agree with them?

Exercise 5. Express your opinion on the idea of ancient Egyptians that magic (or religion) is able to help in treatment.

ANCIENT MEDICAL PRACTICE IN GREECE

Ancient Greece as with Ancient Rome, and Ancient Egypt, played an important role in medical history. The Greeks were practicing medicine 1000 years before the birth of Christ. In the “Iliad” by Homer, injured soldiers were treated by doctors and the Greek leader in the tale, Menelaus, was treated for an arrow wound by a doctor-in-arms, Machaon.

It isn’t entirely clear from historical facts whether Aesculapius really was a physician (like Imhotep in Egypt).

However, one thing is clear: by 1000 B.C. medicine was already a highly respected profession. In Greece the Aesculapia were temples of the healing cult and may be considered precursors of the first hospitals. By modern standards these temples were essentially sanatoriums, with strong religious overtones. In them patients were received and psychologically prepared, through prayer and sacrifice, to appreciate the past achievements of *Aesculapius* and his physician-priests. After the appropriate rituals were completed, the patient was allowed to enjoy “temple sleep”. During the night patients would be visited by a “healer” who administered medical advice or interpreted dreams. In this way patients became convinced that they would be cured if the prescribed regimen (that is, diet, drugs, or blood-letting) was followed and that if they remained ill, it was due to their own lack of faith. Under this approach patients, not the treatment, were at fault if cure did not occur.

One of the most celebrated of these “healing” temples was on the island of Cos—the reputed birthplace of *Hippocrates*, the acknowledged founder of Western medicine. Hippocrates was not so much an innovative physician as a systematic and comprehensive collector of existing remedies and techniques. Because he viewed the physician as a scientist rather than a priest, Hippocrates instilled an essential ingredient into the realm of medicine: the scientific spirit. Under his guidance diagnostic observation and clinical treatment began to replace superstition. Instead of blaming disease on the gods, Hippocrates taught that disease was a natural and rationally comprehensible process and that symptoms were reactions of the body disease. The body itself, he emphasized,

possessed its own means of recovery, and the function of the physician was to aid these natural processes. Hippocrates treated each patient as an original case to be studied and documented. His shrewd descriptions of diseases are models for physicians even today. Individuals trained by Hippocrates and the school of Cos migrated to the far corners of the Mediterranean to practice medicine and spread the philosophies of their preceptor (Sigerest 1951). With the work of Hippocrates, and the school and tradition that stems from him, came the first real break from magic and mysticism, and medicine as a rational art was founded.

1. precursor – предшественник;
2. temple – замок, крепость;
3. to sacrifice – жертвовать;
4. to pray – молиться;
5. to administer – назначать;
6. stem – ствол, стебель;
7. to expand – расширять(ся);
8. to befall (befell, befallen) – случаться, происходить;
9. to avert – отвращать;
10. insistence – настойчивость;
11. superstition – суеверие;
12. domain – владение, имение, сфера, область.

Exercise 1. Find the equivalents:

рационально объяснимый процесс; описание болезней; исцеляющий культ; под руководством; доброкачественная (нефальсифицированная) пища; полностью понятно; средства (ресурсы) выздоровления; диагностическое наблюдение; сфера медицины; вытеснять (замещать) суеверие, быть виноватым; с сильным религиозным оттенком; давать медицинский совет.

Exercise 2. Mark these statements as “true” or “false”:

1. We can't definitely determine whether Aesculapius used to be a physician as soon as there is no proper evidence of this fact.
2. By 1000 B.C. medicine was already a highly respected profession.
3. In Greece Aesculapia were temples of healing cult.
4. These temples can't be regarded as precursors of hospitals.
5. Patients were cured only with diet, drugs or blood-letting, but there weren't any religious overtones in treatment.
6. Hippocrates, the founder of Western Medicine, wasn't so much an innovative physician.

7. Under the guidance of Hippocrates diagnostic observation and clinical treatment began to replace superstition.
8. As a rule Hippocrates blamed disease on the gods, he taught that disease wasn't a natural process.
9. His descriptions of diseases are models for physicians even now.
10. With the work of Hippocrates medicine was founded as rational art, he brought a spirit of science into medical practice.

Exercise 3. *Arrange these sentences as they logically appear in the text:*

1. Hippocrates instilled an essential ingredient into the realm of medicine: the scientific spirit.
2. With the work of Hippocrates the first real break from magic and mysticism and medicine as rational art was founded.
3. One of the most celebrated "healing" temples was on the island of Cos – the reputed birthplace of Hippocrates.
4. By 1000 B.C. medicine was already a highly respected profession.
5. Ancient Greece as with Ancient Rome, and Ancient Egypt, played an important part in medical history.
6. Aesculapia were temples of healing cult.
7. During night patients would be visited by a "healer", who administered medical advice.
8. The Greeks were practicing medicine 1000 years before the birth of Christ.
9. If patients remained ill, it was due to their lack of faith.
10. After the appropriate rituals were completed, the patient was allowed to enjoy "temple sleep".

Exercise 4. *Answer the following questions:*

1. What description of medical practice can we read in the "Iliad" by Homer?
2. What was Aesculapia according to mythology? Are there any facts to prove it?
3. Describe the practice of healing cult of Aesculapius. What did "the process of treatment" consist of?
4. Where was one of the most celebrated "healing" temples, and what was it famous for?
5. What was the contribution of Hippocrates into the development of Western Medicine?
6. What was a disease according to Hippocrates?
7. Hippocrates founded medicine as an art and a practice, didn't he?

Exercise 5. Express your attitude towards the methods of treatment in “healing” temples. Would you be able to experience such kind of treatment? Supply your answer.

ANCIENT MEDICAL PRACTICE IN ROME EMPIRE

As the Roman Empire reached its zenith, and as its influence expanded across half the world, it became heir to the great cultures it absorbed, including the medical advances made by them. Although the Romans themselves did little to further the advancement of clinical medicine (that is, the treatment of the individual patient), they did make outstanding contributions in the area of public health. They had a well-organized army medical service that not only accompanied the legions on their various campaigns to provide first aid on the battlefield but even established “base hospitals” for convalescents at strategic points throughout the empire. In addition the construction of sewer systems and aqueducts provided the empire with the medical and social advantages of sanitation.

Insistence on clean drinking water and unadulterated foods allowed some control and prevention of epidemics and made urban existence, however primitive, possible. Unfortunately, because of inadequate scientific understanding of disease, the preoccupation of the Romans with public health could not completely avert the periodic medical disasters, particularly the plague, that befell its citizens.

Initially Greek physicians and their art were looked upon with disfavor by their Roman masters. As the years passed, however, the favorable impression that these disciples of Hippocrates made on the people became widespread. As a reward for their service to the peoples of the empire, Caesar (46 B.C.) granted Roman citizen-ship to all Greek practitioners of medicine in his domain. Their new status became so secure that when Rome suffered from famine that same year, these Greek practitioners were the only foreigners not expelled from the city. On the contrary they were even offered bonuses to stay.

Galen, considered the greatest physician in the history of Rome, was Greek. For Galen diagnosis became a fine art; in addition to taking care of his own patients, he responded to requests for medical advice from the far reaches of the empire. Galen wrote more than 300 books about his anatomical observations, his selective case histories, the drugs he prescribed, and his boasts. His account of human anatomy, however, was erroneous because he objected to human dissection and obtained his understanding solely from the study of animals. Moreover, because Galen so dominated the medical scene, and because Galenism was openly endorsed by the Roman Catholic Church as the basis for medical practice, medical inquiry was actually inhibited. Galen’s views and

writings became both the “bible” and “the law” as far as the pontiffs and pundits of the ensuing Middle Ages were concerned (Calder 1958).

1. to accompany – сопровождать;
2. first aid – первая помощь;
3. convalescence – выздоровление;
4. sewer systems – сточная система;
5. famine – голод;
6. erroneous – ошибочный;
7. to object to – возражать;
8. solely – исключительно; только;
9. heir – наследник
10. disfavor – немилость, опала.

Exercise 1. Find the equivalents to the following words and combinations:

достигнуть зенита; дальнейшее развитие клинической медицины; выдающийся вклад в области общественного здоровья; преимущества санитарии; доброкачественная пища; предотвращение эпидемии; в том самом году; считался величайшим врачом в истории Рима; утонченное искусство; отвечать на просьбы о совете; вскрытие людей; основы медицинской практики; медицинские достижения; создание сточной системы и акведуков; предотвратить медицинские бедствия.

Exercise 2. Put these statements into the order they appear in the text:

1. Galen so dominated the medical scene that Galenism was openly endorsed by the Roman Catholic Church as the basis for medical practice.
2. The Romans themselves did little to further the advancement of clinical medicine, but they did make contributions in the area of public health.
3. As the Roman Empire expanded its influence across half of the world it became heir to the great cultures it absorbed, including the medical advances made by them.
4. Galen not only took care of his own patients, he responded to requests for medical advice from the far reaches of the empire.
5. Greek physicians and their art were looked upon with disfavor by their Roman masters.
6. Romans had a well-organized army medical service that even established “base hospitals” for convalescents.
7. Because of inadequate scientific understanding of disease they couldn’t completely avert the periodic medical disasters.

Exercise 3. Check your understanding of the text. Mark the right statements.

1. Through long contact with Greek culture, and their eventual conquest of Greece the Romans absorbed many of the Greek ideas of medicine.
2. The Romans did a lot for further advances of clinical medicine.
3. They had constructed sewer systems and aqueducts provided the empire with the medical advantages of sanitation.
4. Insistence on clean drinking water and unadulterated foods allowed some control on epidemics.
5. The ideas of Hippocrates became widespread in the Rome Empire.
6. Caesar didn't grant Roman citizenship to all Greek practitioners of medicine in his domain.
7. Galen, the greatest physician in the history of Rome, was Roman.
8. For Galen diagnosis became a fine art.

Exercise 4. Answer the following questions:

1. Why did the Roman Empire absorb medical knowledge from Greece?
2. What was the contribution of the Romans into the development of medicine?
3. What made the urban existence possible in the Rome Empire?
4. Did they understand disease adequately? What did it lead to?
5. What status did Greek medical practitioners have in the Roman Empire?
6. What was Galen famous for?
7. Why is his account of human anatomy considered to be erroneous?
8. Why was medical inquiry inhibited?

Exercise 5. Discuss the content of the text with your mates, express your own opinion.

MEDICINE IN THE EARLY MIDDLE AGES

With the collapse of the Roman Empire, the church became the main repository of knowledge. This knowledge, including medical knowledge, was literally dispersed among the many monasteries and orders of the church. The teachings of some of the leaders of the early Roman Catholic Church and the belief in divine mercy made inquiry into the causes of death unnecessary and even undesirable in the opinion of many. Curing patients by rational methods became viewed by some members of the church as sinful interference with the will of God. For them use of drugs signified a lack of faith on the part of both doctor and patient, and scientific medicine fell into disrepute. As a result, for almost a thousand years, medical research made little progress. Not until the

sixteenth century, when the Renaissance was in full flower, did significant progress occur in the science of medicine.

Although deficient in medical knowledge societies in the Middle Ages were not entirely lacking in the Christian virtue of charity toward the sick poor, for Christian physicians were bound by their faith to treat the rich and poor alike. The church actually assumed considerable responsibility for the sick. Indeed the evolution of the modern hospital began with the advent of Christianity. Hospitals were established in every cathedral city. The word *hospital* comes from the Latin *hospes*, meaning “host or guest”; the same root has provided the words *hotel*, *hostel*, and *hospice*. These first hospitals were simply places where weary travelers and the sick could find food, lodging, and nursing care provided by the attending monks and nuns.

As the Christian ethic of humanitarianism and charity spread throughout Europe so did its “hospital system.” However, trained “physicians” still practiced their trade primarily in the homes of their patients, and usually only the weary travelers, the destitute and those considered hopeless cases found their way to hospitals.

Although conditions in these early hospitals varied widely—only a few were financed, well managed, and treated their patients humanely—most were essentially custodial institutions keeping troublesome and infectious people isolated. In many such establishments crowding, filth, and high rates of mortality among both patients and attendants were commonplace. As a result the hospital became an institution to be feared and shunned.

1. repository – хранилище;
2. divine mercy – божественное милосердие;
3. disrepute – дурная слава, плохая репутация;
4. to advent – приключаться, происходить;
5. weary – утомленный;
6. lodging – жилище;
7. custodial – попечительский;
8. troublesome – трудный;
9. filth – грязь; грязный, нечистый;
10. to shun – избегать;
11. to signify – выражать, означать, предвещать;
12. monk – монах;
13. nun – монахиня;
14. charity – благотворительность.

Exercise 1. Find the equivalents to the following:

хранилище знаний; греховное вмешательство вволю Бога; впасть в немилость (приобрести дурную славу); быть в расцвете; значительный прогресс; недостаточность медицинских знаний; одинаково лечить и бедных, и богатых; случаи, считавшиеся безнадежными; высокий уровень смертности; практиковать свое ремесло дома у пациентов.

Exercise 2. Arrange the statements as they appear in the text.

1. Hospitals were established in every cathedral city.
2. Conditions in these early hospitals varied greatly.
3. With the collapse of the Roman Empire the church became the main repository of knowledge, medical knowledge as well.
4. The hospital became an institution to be feared and shunned.
5. "Hospital system" spread throughout Europe.
6. Curing patients by rational methods became viewed as sinful interference with the will of God.
7. Trained physicians still practice their trade primary in the homes of their patients.
8. The word "hospital" comes from Latin "hospes", meaning "host or guest".
9. In many hospitals crowding, filth, and high rate of mortality were commonplace.
10. For almost a thousand years medical research made little progress.

Exercise 3. Check your understanding of the text. Point out correct statements.

1. The main repository of knowledge after the collapse of the Rome Empire became healers and magicians.
2. Patients were cured by rational methods only.
3. The use of drugs signified a lack of faith on the part of both doctor and patient.
4. The church actually assumed considerable responsibility for the sick.
5. The evolution of the modern hospital began with the advent of Christianity.
6. Not each cathedral city had its own hospital.
7. First hospitals were the places where everyone could get high-qualified medical help.
8. Christian ethic of humanitarianism and charity spread throughout Europe as well as "hospital system" did.
9. Only a few hospitals were well financed and well-managed and treated their patients humanly, - most were custodial institutions.
10. High rate of mortality was commonplace, that's why hospital became an institution to be feared.

Exercise 4. Answer the following questions:

1. Did medical knowledge “disperse” among the many monasteries and orders to the church?
2. What belief made any inquiry into the causes of death unnecessary and even undesirable?
3. Why did medical research make so little progress during that time?
4. What was the attitude of Christian physicians towards the sick poor and the rich?
5. What is the root of the word “hospital”? What does it mean?
6. What were the main features of the hospital system at that period?
7. Why did hospitals become the place to be feared of?

Exercise 5. Discuss the text. Give facts illustrating the progress made in the development of medicine after the collapse of the Rome Empire.

MEDICAL CARE DURING THE RENAISSANCE

Events in the fifteenth and sixteenth centuries associated with the Renaissance and Reformation undermined the Roman Catholic Church’s monopolistic hold on health care. The study of human anatomy was advanced, and the seeds for further studies were planted by the artists *Michelangelo*, *Raphael*, *Durer*, and of course *Leonardo da Vinci*. These artists viewed the human body as it was and did not simply accept the beliefs of Galen. The Renaissance painters sketched actual people in both sickness and pain and, in the process, provided genuine insight into the workings of the heart, lungs, brain, and muscle structures. At the same time some physicians also began to approach their patients and the pursuit of medical knowledge in an empirical fashion. New medical schools emerged, the most famous of which were founded at Salerno, Bologna, Montpellier, Padua, and Oxford. These medical training centers embraced the Hippocratic doctrine that disease is a natural process amenable to therapeutic intervention based on empirical study and investigation.

During the Renaissance these fundamentals were examined more closely and the age of measurement began. In 1592 Galileo visited Padua, where he lectured on mathematics to large audiences of medical students and explained his theories and inventions, including the thermoscope, the pendulum, and the telescopic lens. Using these devices, one of his students (Sanctorius) made comparative studies of human temperature and pulse. *William Harvey*, who later graduated from Padua, applied Galileo’s laws of motion and mechanics to the problem of blood circulation. His work, which permitted measurement of the

amount of blood moving through the arteries, ultimately enabled the function of the heart to be determined.

Galileo encouraged the use of experimentation and exact measurement as scientific tools that could provide physicians with an effective check against reckless speculation. Quantification meant that theories could be verified before becoming accepted. These new methods were quickly incorporated into the activities of medical researchers. Body temperature and pulse rate became measures that could be related to other symptoms to assist the physician in diagnosing specific illnesses or diseases. Concurrently the development of the microscope amplified human vision, and a previously unknown world came into focus.

Unfortunately these new scientific devices had little effect on the typical physician, who continued to let blood and disperse noxious ointments. Only in the universities did scientific groups band together to pool their instruments, talents, and knowledge.

1. to sketch – делать наброски;
2. to approach – приближаться;
3. pursuit – преследование;
4. amenable – ответственный;
5. reckless – безрассудный;
6. amplified – расширенный;
7. insight – интуиция, предвидение.

Exercise 1. Give English equivalents to the following combinations of the words:

события, связанные с ...; «семена» будущих исследований; гениальная проницательность; терапевтическое вмешательство; эмпирическое изучение и наблюдение; эра измерения; помочь врачу в диагностике; пускать кровь.

Exercise 2. Arrange the following statements as they logically appear in the text:

1. New scientific devices had little effect on the typical physician.
2. The study of human anatomy was advanced, the seeds for future studies were planted by artists Michelangelo, Raphael, Durer, and, of course, Leonardo da Vinci.
3. Body temperature and pulse rate have been measures that could be related to other symptoms to assist the physician in diagnosing illness.
4. During the Renaissance the age of measurement began.
5. These artists viewed the human body as it was.

6. The work of William Harvey permitted measurement the amount of blood moving through the arteries.
7. The Renaissance painters sketched actual people in both sickness and pain and in the process.

Exercise 3. Check your understanding of the text. Mark the following sentences as “True” or “False”:

1. Events in the fifteenth and sixteenth centuries associated with Renaissance and Reformation undermined the Roman Catholic Church’s monopolistic hold on health care.
2. Renaissance artists painted human body with great realism, provided genuine insight into the workings of the heart, lungs, brain, and muscle structure.
3. New medical training centers at Salerno, Bologna, Padua, Oxford, etc. denied the Hippocratic doctrine that disease is a natural process.
4. During the Renaissance some doctrine of Hippocrates were examined more closely.
5. Using devices, invented by Galileo Sanctorius one of his students made comparative studies of human temperature and pulse.
6. William Harvey applied laws of nature to the problem of blood circulation.
7. The work of W. Harvey enabled the function of the heart to be determined.
8. With invention of microscope previously unknown world came into focus.
9. New scientific devices had little effect on the typical physicians who stopped letting blood and dispersing noxious ointments.
10. Only in the universities scientists pooled their knowledge.

Exercise 4. Answer the questions:

1. What were the events of the 15th and 16th centuries associated with?
2. The study of what science was advanced greatly during that period?
3. Who contributed the development of medicine at that time?
4. How did they advance the study of human anatomy?
5. What are other landmarks, undetermined further development of treating methods?
6. Why is the Renaissance usually called the age of measurement?
7. What inventions made impact on improvement of diagnostics?
8. Was that progressive knowledge widely spread among the typical physicians?

Exercise 5. Discuss the text with your group-mates. Assess advantages and disadvantages of the development of medicine as a science and practice during that period.

THE DEVELOPMENT OF MEDICINE DURING THE LATE MEDIEVAL PERIOD (THE XVIII CENTURY)

Practice to read the following words, try to memorize them:

1.	medieval	- средневековый;
2.	revival	- обновление, возрождение;
3.	institution	- заведение;
4.	nonexistent	- несуществующий;
5.	monk	- монах;
6.	excessive	- чрезмерный;
7.	malpractice	- противозаконное действие, злоупотребление;
8.	asylum	- приют, убежище, психиатрическая больница;
9.	nonprofit	- невыгодный;
10.	intact	- нетронутый, неповрежденный, целый;
11.	draper	- торговец мануфактурными товарами;
12.	to grind	- точить, молотить;
13.	soot	- сажа;
14.	rival	- соперник.

Read the text and do exercises that follow it.

THE DEVELOPMENT OF MEDICINE DURING THE LATE MEDIEVAL PERIOD (THE XVIII CENTURY)

The 17th century saw a marked increase in the development of medicine in the field of pathology, diagnostic, further development of hospital system.

In England the medical profession found in Henry VIII a forceful and sympathetic patron who assisted doctors in their fight against malpractice and supported the establishment of the College of Physicians, the oldest purely medical institution in Europe. When he suppressed the monastery system in the early sixteenth century, church hospitals were taken over by the cities in which they were located, bringing about a network of private, nonprofit, voluntary hospitals in which doctors and medical students replaced the nursing sisters and monk-physicians. As a result the professional nursing class became almost nonexistent in these public institutions. Only among the religious orders did nursing remain intact, further compounding the poor lot of patients confined

within the walls of the public hospitals. These conditions were to continue until *Florence Nightingale* appeared on the scene three centuries later.

Yet another dramatic event was to occur. The demands made on England's hospitals, especially the urban hospitals, became excessive as the population of these urban centers continued to expand. These facilities would not accommodate the needs of so many. As a result, during the seventeenth century two of the major urban hospitals in London — St. Bartholomew's and St. Thomas — initiated a policy of admitting and treating only those patients who could be cured. Incurables were left to meet their destiny in other institutions such as asylums, prisons, or the almshouses.

Humanitarian and democratic movements occupied center stage primarily in France and the American colonies during the eighteenth century. The notion of equal rights had come of age, and as urbanization spread, American society concerned itself with the welfare of all its members. Medical practitioners again broadened the scope of their services to include the unfortunates of society and helped to ease their suffering by advocating the power of reason, spearheading prison reform, child care, and the hospital movement. Ironically, as the hospital began to take an active, curative role in medical care in the eighteenth century, the death rate among its patients continued to be excessive. In 1788, for example, the death rate among the patients at the Hotel Dru in Paris — thought to be founded in the seventh century, and the oldest hospital in existence today — was nearly 25 percent. These hospitals were lethal not only to patients, but also to the attendants working in them, whose own death rate hovered between 6 and 12 percent per

Clearly the hospital remained a place to avoid. Under these circumstances the fact that the first American colonists postponed or delayed building of hospitals is not surprising. For example, the first hospital in America, the Pennsylvania Hospital, was not built until 1751, and it was over 200 years after the founding of Boston before its first hospital, the Massachusetts General Hospital, opened its doors to the public in 1821.

This period is also considered to be an era of gross pathology. The backwardness of the Medieval period was followed by marked revival of learning and science approach. Great progress in Medicine as a science practice was made by the efforts of a number of investigators.

Antony von Leeuwenhoek (1632-1723) draper by profession, during his spare time invented the first ever microscope by grinding the lenses himself. He also introduced histological staining in 1714 using saffron to examine muscle fibers.

Marcello Malpighi (1624-1694) used microscope extensively and observed the presence of capillaries and described the 'malpighian' layer of the skin, and lymphoid tissue in the spleen ('malpighian' corpuscles). Malpighi is known as the father of histology.

The credit for beginning of the study of morbid anatomy (pathologic anatomy), however, goes to Italian anatomist-pathologist, *Giovanni B. Morgagni (1682-*

1771). Morgagni was an excellent teacher in anatomy, a prolific writer as well as a practicing clinician. He published his lifetime experiences based on 700 postmortems and clinical findings at the age of 79 and laid the foundations of clinicopathologic methodology in the study of disease. Thus, with Morgagni, pathology had made its beginning on the autopsy table and the concept of clinicopathologic correlation (CPC) had been introduced, establishing a coherent sequence of cause, lesions, symptoms, and outcome of disease.

Sir Percival Pott (1714-1788), famous surgeon in England, identified the first occupational cancer in the chimney sweeps in 1775 and discovered chimney soot as the first carcinogenic agent.

John Hunter (1728-1793) was a student of Sir Percival Pott and rose to become greatest surgeon-anatomist of all times and he, together with his elder brother *William Hunter (1718-1788)* who was a reputed anatomist-obstetrician, started the first ever museum of pathologic anatomy. John Hunter made a collection of more than 13,000 surgical specimens from his flourishing practice, arranged them into separate organ systems, made comparison of specimens from animals and plants with humans, and included many clinical pathology specimens as well, and thus developed the first museum of comparative anatomy and pathology in the world which later became the Hunterian Museum in England. Hunter also described syphilitic chancre (Hunterian chancre) and adductor canal (Hunterian canal).

Among of many pupils John Hunter was *Edward Jenner (1749-1823)*. In fact, Jenner's work on inoculation in smallpox can be traced back to the earlier experiment done by John Hunter on himself by self-inoculation of a venereal lesion from a prostitute on his own glands by a lancet which resulted in delay of his marriage for three years for getting cured.

R.T.H. Laennec (1781-1826), French physician, dominated the early part of 19th century by his numerous discoveries. He described several lung diseases (tubercles, caseous lesions, military lesions, pleural effusion, bronchiectasis), chronic sclerotic liver disease (later called Laennec's cirrhosis) and invented stethoscope.

Morbid anatomy attained its zenith with appearance of *Karl F.von Rokitansky (1804-1878)*, self-taught German pathologist who performed nearly 30,000 autopsies himself. He described acute yellow atrophy of the liver, wrote an outstanding monograph on diseases of arteries and congenital heart defects. He later wrote a book on pathologic anatomy that attracted a lot of criticism from his arch rival and contemporary, *Rudolf Virchow*, because of his own numerous theories in it. Unlike most other surgeons of that time, Rokitansky never practiced surgery and introduced the concept that pathologists confine themselves to making diagnosis .which became the accepted role of pathologist later.

Exercise 1. Form the missing part of speech, translate the combination of the words into Russian. Study the example:

1. (to mark) increase; marked increase – заметный рост;
2. this period (to consider) to be an era of gross pathology;
3. the (backward) of the Medieval period;
4. revival of (to learn);
5. a number of (to investigate);
6. (medicine) profession;
7. (old) purely medical institution;
8. (nurse) class became nonexistent;
9. became (to excess);
10. (broad) the scope;
11. (to accept) role;
12. (to attain) its zenith.

Exercise 2. Translate from Russian into English:

сильный, могущественный покровитель; помогая врачам; частные, неприбыльные, добровольные больницы; население продолжало расти; излечимые/неизлечимые больные; исход болезни; слои кожи; анатомический стол; ограничивали себя.

Exercise 3. Mark the following statements as "True" or "False":

1. Magic and religion were a part of medical practice and everyday life in Europe during the XVII-XVIII centuries.
2. The XVII century saw a marked increase in development of medicine as a science and practice.
3. This period is also considered to be an era of gross pathology.
4. In England the king Henry VIII used to be forceful patron who assisted doctors and supported the establishment of the College of Physicians.
5. Church hospitals were taken into the cities.
6. Nursing class became almost nonexistent, the duties of nurses were executed by medical students.
7. Incurables were treated, though it was hopeless.
8. The hospital remained a place to avoid.
9. Leeuwenhoek didn't grind the lenses himself.
10. John Hunter made an experiment on himself by self-inoculation of a venereal lesion.
11. Rokitansky, self-taught German pathologist practiced surgery.

Exercise 4. Answer the following questions:

1. What is the main feature of the development of medicine during the XVII-XVIII centuries?
2. Can you describe the main events in development of hospital system during this period?
3. What social events influenced the development of medical care?
4. Why were the hospitals a place to avoid?
5. Who invented microscope?
6. Who is known as "the father of histology"?
7. What are the Hunter brothers famous for?
8. Who divided the study of morbid anatomy into two different branches? What are they?
9. What discoveries is R.T.H. Laennec known for?
10. Whose name is associated with zenith of morbid anatomy? Why?

Exercise 5. Discuss the text with your group mates.

If you were a scientist would you be able to make dangerous experiments on yourself to advance medical science? Supply your opinion with the facts.

THE MAIN LANDMARKS IN THE DEVELOPMENT OF MEDICINE IN THE 19TH CENTURY AND THE BEGINNING OF THE 20TH CENTURY

Learn the following words:

1.	recuperation	- восстановление сил;
2.	midwife	- акушерка;
3.	sophistication	- искушенность, умудренность;
4.	delivery	- родоразрешение;
5.	remedy	- лекарство;
6.	significant	- значительный;
7.	simultaneous	- одновременный;
8.	to credit	- почитать;
9.	aptly	- соответствующим образом, быстро, легко;
10.	tumour	- опухоль;
11.	aldehyde	- альдегид;
12.	foster	- воспитывать, лелеять.

Read the text and do exercises that follow it.

THE MAIN LANDMARKS IN THE DEVELOPMENT OF MEDICINE IN THE 19TH CENTURY AND THE BEGINNING OF THE 20TH CENTURY

Before 1900 medicine had little to offer the typical citizen because its resources were mainly the physician and his education and little black bag. A. The shortage had rather different causes than more recent crises in the availability of health care professionals. Although the costs of obtaining medical training were relatively low, the demand for doctors' services was also very small because many of the services provided by the physician could also be obtained from experienced amateurs residing in the community. B. Relatives and neighbors constituted an able and willing nursing staff. Babies were delivered by midwives, and illnesses not cured by home remedies were left to run their frequently fatal course. The contrast with contemporary health care practices, in which specialist physicians and nurses located within the hospital provide critical diagnostic and treatment services, is dramatic.

Not until the nineteenth century could hospitals claim to benefit a significant number of patients. This era of progress was due primarily to the improved nursing practices fostered by Florence Nightingale on her return to England from the Crimean War. C. During the latter part of the nineteenth century, she was at the height of her popularity and influence, and few new hospitals were built anywhere in the world without her advice. During the middle of the nineteenth century, Nightingale forced medical attention to focus once more on the care of the patient. Enthusiastically and philosophically she expressed her views on nursing: "Nursing is putting us in the best possible condition for nature to restore and preserve health." And again: "The art is that of nursing the sick. Please mark, not nursing sickness.

The era of gross pathology had three more illustrious and brilliant physician-pathologists in England who were colleagues at Guy's Hospital in London:

- *Richard Bright (1789-1858)* who described nonsuppurative nephritis, later termed glomerulonephritis or Bright's disease;
- *Thomas Addison (1793-1860)* who gave an account of chronic adrenocortical insufficiency termed Addison's disease; and
- *Thomas Hodgkin (1798-1866)*, who observed the complex of chronic enlargement of lymph nodes, often with enlargement of the liver and spleen, later called Hodgkin's disease.

Besides this period is considered to be an era of technology development and cellular pathology.

Up to middle of the 19th century, correlation of clinical manifestations of disease with pathological findings at autopsy became the major method of study of disease. D. The anatomist-surgeons of earlier centuries were replaced largely with surgeon-pathologists in the 19th century.

Pathology started developing as a diagnostic discipline in later half of the 19th century with the evolution of cellular pathology that was closely linked to technology advancements in machinery manufacture for cutting thin sections of tissue, improvement in microscope, and development of chemical industry and dyes for staining.

E. Subsequently, *G.H.A. Hansen (1841-1912)* identified Hansen's bacillus as causative agent for leprosy (Hansen's disease) in 1873. While the study of infectious diseases was being made, the concept of immune tolerance and allergy emerged which formed the basis of immunization initiated by Edward Jenner.

F. The impetus for the flourishing and successful came from the works of numerous pioneers as the following ones:

- *Paul Ehrlich (1854-1915)*, German physician, conferred Nobel Prize for his work in immunology described Ehrlich's test for urobilinogen using Ehrlich's aldehyde reagent, staining techniques of cells and bacteria, and laid the foundations of hematology;
- *Christian Gram (1853-1938)*, Danish physician, who developed bacteriologic staining by crystal violet;
- *D. L. Romanowsky (1861-1921)*, Russian physician, who developed stain for peripheral blood film using eosin and methylene blue derivatives; *Robert Koch (1843-1910)*, German bacteriologist who, besides Koch's postulate and Koch's phenomena, developed techniques of fixation and staining for identification of bacteria, discovered tubercle bacilli in 1882 and cholera vibrio organism in 1883.

Simultaneous technological advances in machinery manufacture led to development and upgradation of microtomes for obtaining thin sections of organs and tissues for staining by dyes for enhancing detailed study of sections. Though the presence of cells in thin sections of nonliving object cork had been first demonstrated by Robert Hooke in 1667, it was revived as a unit of living matter in the 19th century by *F. T. Schwann (1810-1882)*, the first neurophysiologist, and *Claude Bernarde (1813-1878)*, pioneer in path physiology.

Rudolf Virchow (1821-1905) in Germany is credited with the beginning of histopathology as a method of, investigation by examination of diseased tissues at cellular level. Virchow gave two major hypotheses:

- All cells come from other cells;
- Disease is an alteration of normal structure and function of these cells.

Virchow is aptly known as the father of cellular pathology'.

Soon, knowledge and skill gained by giving accurate diagnosis en postmortem findings was applied to surgical biopsy and thus emerged the discipline of surgical pathology.

Exercise 1. Find the equivalents to the following combinations of the words:

врачей снабжали мало; сравнительно низкая оплата; быстро приводить к фатальному концу; условия в больнице; на пике популярности и влияния; восстанавливать и сохранять здоровье; увеличение лимфатических узлов; продвижение в патологии; микроорганизмы, вызывающие болезнь; получить Нобелевскую премию; на клеточном уровне.

Exercise 2. Some sentences have been removed from the text. Choose from the sentences (1-7) the one which fits each gap (A-G).

1. Until the end of the 19th century, the study of anatomy had remained largely autopsy-based and thus remained a retrospective science. _____
2. Sophistication in surgery led to advancement in pathology. _____
3. In general, physicians seemed to be in short supply. _____
4. Developments in chemical industry led to emergence a viable dye industry for histological and bacteriological purposes. _____
5. She demonstrated that hospital deaths were caused more frequently by hospital conditions than by disease. _____
6. The home was typically the site for treatment and recuperation. _____
7. The discovery of disease-causing microorganisms was made by French chemist Lous Paster (1822-1895). _____

Key: A – 3; B – 6; C – 5; D – 2; E – 7; F – 4; G – 1.

Exercise 3. Mark the following statements as "True" or "False":

1. Before 1900 medicine had little to offer the typical citizen.
2. Babies were delivered by highly qualified medicinal staff, illnesses were easily cured by home remedies.
3. The era of progress in hospitals was due to the practice of Florence Nightingale.
4. The gross of pathology is associated with the doctors, who worked at Guy's Hospital in London.
5. Up to the middle of the 19th century correlation of clinical manifestations of disease with pathological findings became the major method of study of disease.
6. Pathology started developing as diagnostic discipline.
7. In the 19th century the study of anatomy wasn't a retrospective science.

Exercise 4. Answer the questions to the text:

1. What hospital conditions did still exist in hospital in the beginning of the 19th century?
2. What was the main hospital resource?

3. What was the contribution of F. Nightingale?
4. What was the developing of pathology as a diagnostic discipline due to?
5. Who discovered disease-causing microorganisms?
6. Who formed the basis of immunization?
7. What is Rudolf Virchow credited for?

Exercise 5. Express your opinion on the following:

If you were a physician, lived that time, who of the mentioned scientists would you like to assist? Why?

AT THE TURN OF THE 20TH CENTURY

Learn the following words:

1.	pace	- шаг, скорость, темп;
2.	permeate	- проникать, проходить сквозь;
3.	facet	- грань;
4.	apparent	- явный, очевидный, кажущийся;
5.	fertilization	- удобрение;
6.	stride	- большой шаг;
7.	alleviate	- облегчать;
8.	insights	- проницательность, понимание;
9.	abnormality	- нарушение;
10.	loom	- неясно вырисовываться;
11.	approach	- приближение, подход;
12.	spurt	- поток, течение.

Read the text and do exercises that follow it.

AT THE TURN OF THE 20TH CENTURY

Since the beginning of the twentieth century, technological innovation in the fields of basic science and engineering has taken place at such a rapid and accelerating pace that sophisticated and complex technologies permeate almost every facet of contemporary life. The consequences of this process have been dramatically apparent in the realm of medical science and the delivery of health care services.

The origins of the changes that occurred within medical science are found in the rapid developments that took place in the applied sciences (chemistry, physics, engineering, microbiology, physiology, pharmacology, and so on) at the turn of

the century. This process of development was characterized by intense interdisciplinary cross fertilization and provided an environment in which medical research was able to take giant strides forward in the development of techniques for the diagnosis and treatment of disease. For example, advances in organic chemistry made it possible to isolate (and in some important cases to synthesize) the active ingredients of drugs and anesthetics that had been previously available only in vegetable form. These developments not only alleviated suffering and permitted more controlled drug use.

Sulfa drugs, antibiotics, cortisone, and many other milestone achievements of pharmacology became commonplace due to the expansion of industrialized techniques that made mass production possible. Similar achievements in *radiology, cardiology, encephalography*, and the like were made possible only because of corresponding feats in electrical and mechanical engineering that insured their widespread adoption.

New discoveries in medical science followed one another like intermediates in a chain reaction. However, the most significant innovation for clinical medicine was the development of X-ray technology. When *W. K. Roentgen* described in 1895 these "new kinds of rays," the inner human was opened to medical inspection. Initially X-rays were used in the diagnosis of bone fractures and dislocations. In the process this modern technology became commonplace in most urban hospitals. Separate departments of radiology were established, and the influence of their activities spread to almost every other department of medicine (surgery, gynecology, and so forth).

X-ray technology gave physicians an enormously powerful tool that for the first time permitted the accurate diagnosis.

When reviewing some of the most significant developments in health care practices, one is astounded to find that they have occurred fairly recently — that is, within the last fifty to sixty years. Consider, for example, that electroencephalography (EEG) — the recording of the electrical activity of the brain — was not available until 1929 when it was developed by *Hans Berger*. The information provided by this instrumentation technique has proved as important in the diagnoses of cerebral disease as the electrocardiograph (ECG) has been in heart disease.

Further it was not until the introduction of sulfanilamide in the mid-1930s and penicillin in the early 1940s that the main danger of hospitalization — that is, cross-infection among patients — was significantly reduced. With these new drugs in their arsenals, surgeons were able to perform their operations without prohibitive morbidity and mortality due to infection.

The employment of the available technology assisted in advancing the development of complex surgical procedures. The Drinker respirator was introduced in 1927 and the first heart-lung bypass machine in 1939.

Accurate diagnoses of congenital and acquired heart disease (mainly valve disorders due to rheumatic fever) also became possible, and a new era of cardiac and vascular surgery was established.

The second industrial revolution uncovered numerous ways in which engineers interested in the solution of biomedical problems could help their colleagues in the life sciences that a new profession was created — biomedical engineering (Bronzino 1977, 1986).

The development of a new round of medical instruments such as electrocardiographs, spectrophotometers, electron microscopes, and radioisotope equipment all became possible due to the emergence and activity of these new professionals (Bronzino 1971). The impact of these discoveries and many others was profound.

After World War II, the evolution of comprehensive medical care accelerated rapidly, partly as a result of the technological insights obtained in the pursuit of military objectives that then became available for peaceful applications.

1. The realm of electronics became prominent, making possible the mapping of the subtle electrical behavior of the fundamental unit of the central nervous system — the neuron — and the monitoring of beating hearts of patients in intensive care units.

2. Nuclear medicine, an outgrowth of the atomic age, emerged as a powerful and effective approach in detecting specific physiological abnormalities.

Scanning systems presently available enable this information to be obtained quickly and with minimal hazard to the patient.

3. *Diagnostic ultrasound*, based on sonar techniques, has been so widely accepted that diagnostic ultrasonic studies are now part of the routine diagnostic evaluation required in many medical specialties. Ultrasound is based on the fundamental concepts of acoustics and involves no exposure to radiation, no injections, no swallowing of radioactive materials, in essence, no discomfort of any kind.

Of the technological innovations of the twentieth century, the electronic computer looms as a true giant. During the 1970s and 1980s the expansion of *computer technology* has been explosive, involving almost every facet of human activity. Today computers are nearly everywhere. Yet despite this tremendous growth spurt, computers are considered to be still in their infancy.

Exercise 1. Circle the correct definitions of the words below:

1. apparent	2. realm	3. allocate	4. perks	5. stamina
a) different;	a) field;	a) take;	a) benefits;	a) efforts;
b) obvious;	b) effort;	b) give;	b) money;	b) argument;
c) distinguished.	c) response.	c) invest.	c) present.	c) energy.

Key:

1 - b;

2 - a;

3 - a;

4 - a;

5 - c.

Exercise 2. *Decide if the statements below are TRUE or FALSE:*

1. In the 20th century the development of medicine as technologies and science moved comparatively slowly.
2. Rapid developments took place also in applied sciences (chemistry, physics, microbiology, pharmacology, etc).
3. The application of sulfa drugs and antibiotics became commonplace.
4. New discoveries in medical science followed one another.
5. The prominent advancement in diagnostics was made due to the discovery of X-rays, and in the 20th century it became a common practice.
6. New technologies didn't assist in advancing different surgical procedures.
7. There is no connection between the second industrial revolution and growth of medical science and practice.
8. The impact of new discoveries was profound.
9. Nuclear medicine is a powerful approach in diagnostics of specific disorders.
10. Diagnostic ultrasound, based on sonar techniques, isn't used widely in the routine diagnostic routine.
11. The impact of computer technology has been extensive.

Exercise 3. *Finish the sentences according to the text:*

1. Since the beginning of the 20th century, technological innovation in the fields of basic science and engineering has taken place...
2. The origins of the changes that occurred within medical science are found...
3. Sulfa drugs, antibiotics, cortisone...
4. When W. K. Roentgen described in 1895...
5. When reviewing some of the most significant developments...
6. The employment of the available technology assisted...
7. The second industrial revolution uncovered numerous ways...
8. The development of a new round...
9. Nuclear medicine, an outgrowth of the atomic age...
10. Ultrasound is based on...
11. During the 1970s and 1980s...

Exercise 4. *Answer the questions:*

1. What consequences did rapid development of basic science make in the realm of medicine?
2. What was this process characterized by?

3. What innovation is considered to be the most significant for clinical medicine?
4. What is meant by EEG&ECG? Who developed this method?
5. What drugs enable surgeons to perform their operations without mortality because of infection?
6. What complex surgical procedures developed greatly as well?
7. What new branch appeared due to the second industrial revolution?
8. Why did the evolution of medical care accelerate rapidly after World War II?
9. What is the period of 1970s and 1980s especially famous for?
10. Do you agree that computers in medicine are still in their infancy?

Exercise 5. Discuss the text with you group mates. Express you opinion on the following:

1. What discovery of the 20th century do you consider to be the most valuable for the humanity? Why?
2. Add the information, given in the text. What other landmarks in the development of med. science and practice in the 20th century do you know?

Вариант задания № 2

Find equivalents to the following combinations of the words:

технологические нововведения; быстрое развитие; в начале века; гигантские шаги вперед; облегчили страдания; широкое применение; раздел медицины; невероятно могущественный; церебральные заболевания; решение биомедицинских проблем; в военных целях; мирное применение; порождение атомного века; эффективное продвижение; огромный рост этого течения.

MODERN MEDICINE (1950-S TO DOWN OF THE 21ST CENTURY)

Learn the following words:

1.	mold	- смешивать, взбивать;
2.	influx	- приток, наплыв;
3.	probe	- зонд, зондировать;
4.	transfer	- перенос, перемещение;
5.	mammals	- млекопитающие;
6.	comprise	- заключать в себе, охватывать;
7.	stem cells	- стволовые клетки;

8.	lieu	- вместо;
9.	confine	- ограничивать, заключать в себе;
10.	myeloid	- относящийся к спинному или костному мозгу, миелоидный.

Read the text and do exercises that follow it.

*MODERN MEDICINE
(1950-S TO DOWN OF THE 21ST CENTURY)*

Technology has always molded medical care. The medical profession benefited in many important ways from the resulting influx of technological discoveries. Over the years the practice of medicine has become dependent on the number of diagnostic tests and procedures performed in clinical laboratories. These tests, ranging from a rather simple physical measurement to such sophisticated techniques as atomic absorption spectrophotometry, form the basis for most of diagnosis and therapeutic procedures initiated by today's health care team.

The strides made in the latter half of 20th century until the beginning of 21st century have made it possible to study diseases at molecular level, and provide an evidence-based and objective diagnosis and therapy. The major impacts of advances in molecular biology are in the field of diagnosis and treatment of genetic disorders, immunology and in cancer. Some of the revolutionary discoveries during this time are the following:

- Description of the structure of DNA of the cell by *Watson* and *Crick* in 1953.
- Identification of chromosomes and their correct number in humans (46) by *Tip* and *Levan* in 1956.
- Identification of Philadelphia chromosome in chronic myeloid leukaemia by *Nowell* and *Hagerford* in 1960 as the first chromosomal abnormality in any cancer.
- In Situ Hybridization introduced in 1969 in which a labeled probe is employed to detect and localize specific RNA or DNA sequences 'in situ' (i.e. in the original place).
- Recombinant DNA technique developed in 1972 using restriction enzymes to cut and paste bits of DNA.
- In 1983, *Kary Mullis* introduced polymerase chain reaction (PCR) i.e. "xeroxing" DNA fragments that revolutionized the diagnostic molecular genetics.
- The flexibility and dynamism of DNA invented by *Barbara McClintock* for which she was awarded Nobel Prize in 1983.
- In 1997, *Ian Wilmut*, a Scottish scientist and his colleagues at Roslin Institute in Edinburgh, successfully used a technique of somatic cell nuclear transfer to

create the clone of a sheep; the cloned sheep was named Dolly. This has set in the era of mammalian cloning.

- In June 2000, discovery of chemicals of the approximately 80,000 genes that make up the human body, their structure and position on chromosomes (i.e. mapping of the human genome) has been successfully carried out. The functions of most of the genes that comprise human genome have also been identified. All this has opened new ways in treating and researching an endless list of diseases that are currently incurable.
- Recent report in April 2004 suggests that Prof Wilmut's group, which first cloned the sheep Dolly, has applied to the regulatory authorities for therapeutic cloning of human embryos for use in treating motor neuron disease, and the embryo will be destroyed after therapeutic use. Apparently, at present time this has raised serious ethical issues and reservations. For the students, it should be known that this stage of molecular biology has been reached due to availability of human stem cell research in which embryonic stem cells obtained from in vitro fertilization will be used for cell therapy e.g. introducing insulin-producing cells into the pancreas in a patient of insulin-dependent diabetes mellitus, or using embryonic stem cells cultured in the laboratory in lieu of a whole organ transplant. It seems that time is not far when organs for transplant may be 'harvested' from the embryo.

These inventions have set in an era of human molecular biology that is no longer confined to research laboratories but is ready for application as a modern diagnostic and therapeutic tool. Modern day human molecular biology is closely linked to information technology; the best recent example is the availability of molecular profiling by DNA microarrays in which by a small silicon chip, expression of thousands of genes can be simultaneously measured.

Exercise 1. Find the equivalents:

во многом преуспеть; тесты и процедуры, выполняемые в клинических лабораториях; физические измерения; сложные технологии (техники); вторая половина 20-го века; на молекулярном уровне; клонировать овцу; открыли новые пути излечения; этические ограничения; культивированные в лаборатории; органы для трансплантации; «взрачивать» из эмбриона; измерять одновременно; тесно связанный.

Exercise 2. Arrange the sentences logically as they appear in the text.

1. Modern human molecular biology is closely linked to information technology.
2. In 1983 Kary Mullis introduced polymerase chain reaction.
3. In 2004 prof. Wilmut's group applied for therapeutic cloning of human embryos.

4. The strides made in the later half of 20th century until the beginning of 21th century made it possible to study diseases.
5. In June 2000, discovery of chemicals of the approximately 80,000 genes that make up the human body has been carried out.
6. Description of the structure of DNA of the cell was done by Watson and Crick in 1953.
7. The first clone (of a sheep) was created in 1997.
8. For discovery of the flexibility and dynamism of DNA Barbara McClintock was awarded Nobel Prize in 1983.

Exercise 3. *Decide if the sentences below are TRUE or FALSE:*

1. The latest discoveries didn't influence greatly the daily hospital & Clinical routine.
2. The strides made in the later half of the 20th century until the beginning of 21st century have made it possible to study diseases at molecular level.
3. Recombinant DNA technique developed in 1972.
4. The era of mammalian cloning started in 1998.
5. The structure and position of chromosomes was successfully described by Kary Mullis in 1983.
6. It seems that time is not far when organs for transplant maybe "harvested" from the embryo.

Exercise 4. *Answer the questions:*

1. What made possible to study diseases at the molecular level?
2. In what fields are the major impacts of molecular advances?
3. Who & when described the structure of DNA?
4. Who & when identified chromosomes and their correct number?
5. What of the important discoveries of 60-s can you point out?
6. What was Kary Mullis awarded Nobel Prize for?
7. What event revolutionized medicine in 1997?
8. What discovery was made in June, 2000?
9. Who and when made a report about cloning human embryos?
10. What is modern day human molecular biology closely linked to?

Exercise 5. *Express your opinion towards the problems facing medicine in the 21st century. What's your attitude towards cloning? What kind of ethic problems can it cause, to your mind?*

UNIT II. FROM THE HISTORY OF BOTANY

EARLY HISTORY OF PLANT STUDY

Plants and Primitive Peoples

By 8000 B.C., our ancestors had begun to develop more reliable sources of food through primitive forms of agriculture. Compelling archaeological evidence indicates the cultivation of grain, legumes, and certain fruits (e.g., figs, olives, pomegranates, dates) was well established in the Near East by 6500 B.C. By the seventh century B.C. Assyrians had produced a systematically arranged list of medicinal plants, which suggests that the physicians and pharmacists of the day had a noteworthy knowledge of plants and their uses.

The Chinese have been cultivating medicinal and other useful plants for at least 4,500 years. Some authorities agree, however, that the founder of Chinese agriculture was an emperor by the name of Shen Nung. He appears to have been an authority* on poisons and antidotes. He also wrote a book on drugs and medicines that was incorporated into the *Pun-tsao*, a Chinese *pharmacopoeia* (an officially recognized book describing drugs and medicines) of 40 volumes, published during the seventeenth century. During the Han dynasties, which lasted from about 200 B.C. until the birth of Christ, gardens became very extensive in China and many ornamental plants were cultivated. Plants, such as primroses, poppies, and chrysanthemums, were brought to the Western world from China over 2,000 years ago.

* He appears to have been an authority ... – Он, оказывается, был знатоком.

legume ['legju:m] *n.* – плод бобовых, боб;

pomegranate ['pɒm,græni:t] – гранат;

date [deɪt] *n.* – финик;

antidote ['æntɪdəʊt] *n.* – противоядие.

Botany as a Science

The study of plants, called **botany** – from the French word *botanique* (botanical) and three Greek words *botanikos* (botanical), *botane* (plant or herb), and *boskein* (to feed) – appears to have had its origins with Stone age peoples who sought to modify their surroundings and feed themselves. Initially, the primary interest in plants was practical, entering around how plants might provide food, fibers, fuel, and medicine. Eventually, however, an intellectual

interest arose. Individuals became curious about how plants reproduced and how they were put together. This inquisitiveness led to plant study becoming a science, which broadly defined is simply “a search for knowledge of the natural world”.

Plant science existed in ancient Greece. As in even older cultures, the study of plants started when the early Greeks developed a practical interest in food and drug plants, but they slowly became curious as well about the structure and function of plants. As the physicians and the pharmacists of the era gathered and used medicinal plants, they studied the variations and forms and came to recognize apparent relationships among them.

One of these Greek herbal physicians had a son in 384 B.C., who became one of the most renowned philosophers of all time – **Aristotle the Stagirite**. Although Aristotle is perhaps better known for his philosophical works, he was an accomplished mathematician and also acquired extensive knowledge in nearly all aspects of natural history. In fact, he combined philosophical and scientific interests as few other philosophers had done. At the age of 17, Aristotle went to Athens, where he became a pupil of Plato. He left Athens after Plato’s death in 347 B.C. , and studied marine animals at a coastal area for several years, eventually returning to Athens to found the first botanical garden of which there is any record.

When Aristotle died, he willed the botanical garden and its associated library to his pupil and assistant, **Theophrastus of Eresus**. Theophrastus was an extraordinary man, who not only acquired virtually all the knowledge Aristotle had accumulated on plants but also added prodigiously to it from his own observations. It is said that he had 2,000 disciples and wrote 200 treatises. The most important of the latter to have survived are two books entitled *History of Plants* and *Causes of Plants*. So great were his contributions to botany as a science that the famous eighteenth-century Swedish botanist Linnaeus gave him the title “Father of Botany”. Few, if any, dispute his right to the honor.

seek (sought) *v.* – стремиться;

become curious – проявлять любопытство;

inquisitiveness [in' kwizitivnəs] *n.* – любознательность;

search [sə:tʃ] *n.* – поиски;

apparent [ə' pærənt] *a.* – явный, очевидный;

disciple [di' saɪpl] *n.* – ученик, последовать;

treatise [' tri:tiz] *n.* – трактат; научный труд;

survive [sə' vaɪv] *v.* – уцелеть;

will *v.* – завещать.

Herbals Appear

During the second century A.D., two books that had a significant influence on botanical studies appeared. **Pliny's** *Historia Naturalis* contained lists of food or medicinal plants; and **Dioscorides'** *Materia Medica*, was the first book to contain illustrations of plants, all laboriously copied by hand. Many of the common names used by Dioscorides are still used today. European scholars who followed Dioscorides continued, by hand, to copy these books, which became known as **herbals**, and held them in such high esteem that it was considered heresy to question anything in their contents; consequently, few new ideas were added during the Dark and Middle Ages that lasted from 400 to 1400 B.C.

With the advent of the printing press in the middle of the fifteenth century, the number of herbals mushroomed, and the period from about 1500 to 1700 B.C. became known as the *Age of Herbals*. These botanical works were primarily the products of German botanists, although some Italian and English botanists made their own contributions between 1470 and 1670.

The *herbalists*, as they were called, were mostly concerned with medicinal plants, which they studied in the botanical gardens that had become numerous and extensive in Europe by this time. They produced elaborate and intriguing illustrations for the herbals, occasionally accompanied by outlandish stories and descriptions. Some of the stories became legends and developed into the *Doctrine of Signatures*. According to this doctrine, if a part of a plant, such as the root, had the shape of a part of the human body, it would be useful in treating a disease of the human part it most closely resembled. For example, the meat of a walnut, which somewhat resembles a miniature brain, was used in treating brain diseases, and hepatica leaves, which have lobes reminiscent of those of the liver, were used to treat ailments of that organ. One of the more famous herbalists was **Otto Brunfels**, who published a three-volume herbal in 1530. His work had excellent illustration and is considered to be a link between ancient and modern botany.

heresy ['herəsi] *n.* – ересь;

mushroom ['mʌʃrʊm] *v.* – расти как грибы; быстро распространяться;

outlandish [aʊt 'lændɪʃ] *a.* – диковинный, необычный;

reminiscent [,remɪ 'nɪsnt] *a.* – напоминающий (of).

Exercise 1. Agree or disagree with the following statements and correct the false ones:

1. A systematically arranged list of medicinal plants was made by Assyrians by the seventh century.
2. A Chinese pharmacopoeia was published in the 16th century.

3. The primary interest in plants of the Stone age people was practical and plants were viewed as a source of food, fibers, fuel, and medicine.
4. Plant science didn't exist in ancient Greece.
5. Aristotle who is better known for his philosophical works, combined philosophical and scientific interests.
6. Dioscoride not only acquired all the knowledge Aristotle had accumulated on plants but also contributed greatly to further development of botany.
7. The Age of Herbals was named so, because the number of herbals mushroomed during the period from about 1500 to 1700 B.C.
8. The herbalists studied medicinal plants in the numerous botanical gardens throughout Europe and produced elaborate illustrations for the herbals.

Exercise 2. Translate from Russian into English:

выращивание зерновых, бобовых и некоторых фруктов; составили систематизированный список лекарственных растений; он был знатоком ядов и противоядий; официально признанная книга, описывающая наркотические и лекарственные средства; также заинтересовались строением и функцией растений; приобрел обширные знания; в конце концов, возвратившись в Афины, чтобы создать первый ботанический сад; его научный вклад в ботанику был настолько велик; число книг о травах росло как грибы; знатоки трав; они создали искусно выполненные и увлекательные иллюстрации; согласно доктрине; использовались для лечения болезни того органа, с которым имели наибольшее сходство.

Exercise 3. Answer the following questions:

Plants and primitive people

1. When did primitive people begin to cultivate grains, legumes and certain fruits?
2. Who had produced a systematically arranged list of medicinal plants by the 7th century B.C.?
3. Who was the founder of Chinese agriculture?
4. Whose compiled book on drugs and medicines was incorporated into Chinese pharmacopoeia?

Botany as a science

5. What is botany?
6. What was the primary interest in plants of Stone Age people?
7. How is a "science" defined?
8. Who founded the first botanical garden in Greece?
9. Whom did Swedish botanist Linnaeus call "Father of Botany" and why?

Herbals appear

10. What two books, containing lists of food or medicinal plants were known during the second century A.D.?
11. What are herbals?
12. What period is known as the Age of Herbals?
13. What botanists made significant contribution to Botany in the period known as the Age of Herbals?
14. What were the duties of herbalists concerned with?
15. What is the essence (суть) of the Doctrine of Signatures?

Exercise 4. Match the name of a person and his contribution made in the field of botany.

1. Shen Nung;
 2. Aristotle the Stragirite;
 3. Theophrastus of Eresus;
 4. Pliny;
 5. Dioscoride;
 6. Otto Brunfels.
-
1. His three-volume herbal published in 1530 is considered to be a link between ancient and modern botany.
 2. He appears to have been an authority on poisons and antidotes and wrote a book on drugs and medicines incorporated into a Chinese pharmacopoeia.
 3. His book “History Naturalis” containing lists of food or medicinal plants appeared during the second century A.D.
 4. He became one of the most famous philosophers of all time who also studied marine animals at a costal area and founded the first botanical garden in Greece.
 5. He is said to have had 2000 disciples and wrote 200 treatises. Because of his great contribution to botany he was given the title “Father of Botany” by Swedish botanist Linnaeus.
 6. His treatise “Materia Medica” was the first book to contain illustrations of plants, all laboriously copied by hand. Such books became known as herbals.

DEVELOPMENT OF PLANT STUDY

The First Microscopes

The microscope had and continues to have a profound effect not only on plant studies but also on the biological sciences and related fields as a whole. In 1590, **Zacharias and Francis Janssen**, Dutch brothers who were spectacle makers, drew on the experience of their father, Hans, who was famous for his optical work. They discovered how to combine two convex lenses in the interior of a tube, and produced the first instrument for magnifying minute objects. Because of this, Zacharias Janssen, in particular, is often referred to as the inventor of the compound microscope, although it was Faber of Bamberg, a physician serving Pope Urban VIII, who originally applied the term *microscope* to the instrument during the first half of the seventeenth century.

A Dutch draper by the name of **Anton van Leeuwenhoek** (1632-1723), who ground lenses and made microscopes in his spare time, is best known for his development of primitive microscope. Leeuwenhoek was the first to describe bacteria, sperms, and other tiny cells he observed with his microscopes, some of which could magnify as much as 200 times. In his will, he left 26 of his 400 handmade microscopes to the Royal Society of London.

profound [prə'faund] *a.* – основательный;

convex [ˈkɒn'veks] *a.* – выпуклый;

grind (ground) [graɪnd] *v.* – вытачивать;

magnify [ˈmæɡnɪfaɪ] *v.* – увеличивать.

Diversification of Plant Study

Before the invention of the microscope, plant study had been dominated by investigation based primarily on the external features of plants. The magnification of the early microscopes was not very great present standards, but these instruments nevertheless led to the discovery of *cells* and opened up whole new areas of study. **Plant anatomy**, which is concerned chiefly with the internal structure of plants, was established through the efforts of several scientific pioneers. Early plant anatomists of note included **Marcello Malpighi** (1628-1694) of Italy, who discovered various tissues in stems and roots, and **Nehemiah Grew** (1628-1711) of England, who described the structure of wood more precisely than any of his predecessors.

Plant physiology, which is concerned with plant function, was established by **J.B. van Helmont** (1577-1644), a Flemish physician and

chemist, who was the first to demonstrate that plants do not have the same nutritional needs as animals.

The seventeenth century saw a marked increase in botanical explorations to various parts of the globe. In the fifteenth century when Columbus visited Cuba, he found local Indian tribes cultivating corn (maize). This important food plant apparently been in use by the pre-Incas of Peru some 5,000 years earlier.

American Indians had also domesticated the white potato, and Indians were cultivating flowers and medicinal plants in Mexico.

The explorers took large numbers of plants back to Europe with them, and it soon became clear to those working with the plants that some sort of formalized system was necessary just to keep the collections straight. Several *plant taxonomists* (botanists who specialize in the identifying, naming, and classifying of plants) proposed ways of accomplishing this, but we owe our present system of naming and classifying plants to the Swedish botanist **Carolus Linnaeus** (1707-1778). *Plant taxonomy (also called plant systematics)*, which is the oldest branch of plant study, began in antiquity, but Linnaeus did more for the field than any other person in history. Thousands of plant names in use today are those originally recorded by this remarkable man in his book *Species Plantarum*, published in 1753.

Theophrastus (fourth century B.C.) was the first person on record to have systematically discussed the relationship of plants to their surroundings, but the discipline of plant geography, the study of how and why plants are distributed where they are, did not develop until the nineteenth century. The allied field of *plant ecology*, which is the study of the interaction of plants with one another and with their environment, also developed in the nineteenth century.

Among the most noteworthy of the early plant geographers were two natives of Berlin, Germany, **Carl Willdenow** (1765-1812) and **Alexander von Humboldt** (1769-1859), who published books on the relationship of seed dispersal to plant distribution and on the associations of various plants with one another in tropical and temperate climates. These studies were brought to a climax by **Sir Joseph D. Hooker** (1817-1911), who eventually became director of the Royal Botanic Gardens in Kew, England. Hooker traveled widely studying plant life in both the Northern and Southern Hemispheres, and he also published floras (accounts of the plants of a specific region) of India and Antarctica. Charles Darwin, whose books (particularly his *Origin of Species*) revolutionized some basic biological concepts of the adaptation of organisms to their environment, said of Hooker's *Flora Antarctica*, "It is by far the grandest and most interesting essay on subjects of nature I have ever read".

The study of the form and structure of plants, *plant morphology*, was developed during the nineteenth century, and by the beginning of the twentieth century, much of the basic information incorporated in the plant sciences today had discovered and elucidated. The number of scientists engaged in investigating plants had also increased conspicuously. *Genetics*, the science of

heredity, had been founded by the Austrian monk **Gregor Mendel** (1822-1884) through his classic experiments with peas. *Cytology*, the science of cell structure and function (now called *cell biology*), had received great impetus from the discovery of how cells multiply and function in sexual reproduction. The mid-twentieth-century development of *electron microscopes* further spurred cell research and led to a vast new insight into cells and new forms of cell research that continues to the present.

predecessor ['pri:dɪsɪsə] *n.* – предшественник, предок;
nutritious [ɲju(:)'trɪʃəs] *a.* – питательный;
maize [meɪz] *n.* – кукуруза, маис;
domesticate [dəʊ'mestɪkeɪt] *v.* – культивировать (растения);
owe [əʊ] *v.* – быть обязанным;
surroundings [sə'raʊndɪŋz] – среда;
distribute [dɪs'trɪbjʊ(:)t] *v.* – распространять;
noteworthy ['neut,wə:ði] *a.* – заслуживающий внимания;
environment [ɪn'vaɪərənmənt] *n.* – окружающая обстановка (среда);
incorporate [ɪn'kɔ:pəɪt] *v.* – включать;
elucidate [ɪ'lu:sɪdeɪt] *v.* – объяснять;
heredity [hɪ'redɪtɪ] *n.* – наследственность.

Plant Sciences and the Future

There is still a vast amount of information to be discovered, and new discoveries continue to be made daily. As far back as 1938, for example, 11,000 papers on botanical subjects were published in that year alone; the number in recent years is many times greater. Further, it appears probable that at least one-third of all the organisms traditionally regarded as plants (particularly algae and fungi) have yet to be named, let alone thoroughly investigated.

Wild plants and animals are becoming extinct at a rapidly accelerating rate as their natural habitats are destroyed through development and pollution; in fact, there is strong evidence that many undescribed organisms are becoming extinct before we have learned anything about them. Efforts must be upgraded to educate the general public on the necessity of preserving natural habitats so that the numerous tangible and aesthetic benefits of doing so will be available to succeeding generations. Also, both basic and applied research in botany must be given additional support if the earth's burgeoning human population is to continue to be fed, clothed, and housed.

habitat ['heɪtæt] *n.* – место распространения; естественная среда;
extinct [ɪks'tɪŋkt] *a.* – вымерший;
evidence ['eɪdɪns] *n.* – данные;
burgeoning ['bɜ:dʒənɪŋ] *a.* – растущий.

Exercise 1. Translate from Russian into English.

Первый прибор для увеличения микроскопических объектов (изучения); первый описал бактерии и другие микроскопические клетки; микроскопы, сделанные вручную; первый доказал, что; обнаружил, что племена индейцев выращивали маис; также культивировали белый картофель; связь между растениями и средой их произрастания; революционизировал основные биологические концепции адаптации организмов к окружающей их среде; наука о наследственности; дикорастущие растения и животные вымирают; естественная среда обитания; растущее население земли.

Exercise 2. Choose the proper variant.

1. The relationship of plants to their surroundings was systematically discussed by ...
 - a) Theophrastus in the fourth century B.C.;
 - b) Carolus Linnaeus in the 18th century;
 - c) Marchello Malpighi in the 17th century.
2. The first instrument for magnifying minute objects was discovered by ...
 - a) Hans Janssen;
 - b) Zacharias and Francis Janssen;
 - c) Anton van Leeuwenhoek.
3. A marked increase in botanical explorations to various parts of the globe was seen in ...
 - a) the 15th century;
 - b) the 17th century;
 - c) the 18th century.
4. Charles Darwin's words "It is by for the grandest and most interesting essay on subjects of nature I have ever read" can be attributed to the book written by ...
 - a) Alexander von Humboldt;
 - b) Nehemiah Grew;
 - c) Joseph D. Hooker.
5. The study of the form and structure of plants was developed in ...
 - a) the 19th century;
 - b) the 20th century;
 - c) the 18th century.

Exercise 3. Match the name of a person in A and his contribution made in the field of botany in B.

A.

1. Anton van Leeuwenhoek a Dutch draper, an early plant anatomist of Italy;

2. Marcello Malpighi;
3. J.B. van Helmont, a Flemish physician and chemist;
4. Carolus Linnaeus;
5. Carl Willdenow and Alexander von Humbold;
6. Joseph D. Hooker;
7. Gregor Mendel.

B.

1. ... published books on the relationship of seed dispersal to plant distribution and on the associations of various plants with one another in tropical and temperate climates.
2. ... founded genetics, the science of heredity.
3. ... proposed the present system of naming and classifying plants.
4. ... studied plant life in both the Northern and Southern Hemispheres and also published floras of India and Antarctica.
5. ... was the first to demonstrate that plants do not have the same nutritional needs as animals.
6. ... is best known for his development of primitive microscope with the help of which bacteria, sperms and other tiny cells could be observed.
7. ... discovered various tissues in stems and roots of plants.

Exercise 4. Define the following terms as they are used in the text:

plant anatomy; plant physiology; plant taxonomy; plant ecology; plant geography; plant morphology; genetics; cytology.

Exercise 5. Reread the passage “Plant sciences and the Future” and think of your idea about further development of plant sciences.

I. FEEDING THE WORLD

There are many factors involved in feeding the world's population, the most important of which is the size of the population. Our population is growing extremely fast.

Botanists have struggled to produce enough food for the population. One of the pioneers in this struggle *Borlaug* began creating new varieties of plants in 1944 and soon achieved remarkable results. For example, in 1944 Mexico imported wheat to feed its citizens. By 1964, however, Mexico was exporting wheat. Since 1950, production has quadrupled. Similar advances have been made in Pakistan and other countries. This dramatic increase in production was called the “Green Revolution”. For his work, Borlaug received a Nobel Prize in

1970 – not so much for the technology that produced the high-yielding crops, but more for his humanitarianism as he tried to help feed the world. However, even his Green Revolution hasn't been able to keep up with the ever-increasing demand for food. Moreover, critics claim that the Green Revolution actually worsened the problem because it created social and environmental havoc.

The Green Revolution and similar programs have not eliminated world hunger because they have not addressed the problem that drives world hunger: overpopulation.

The consequences of these facts are devastating. For example, in 1990, more than 1.1 billion people – that's one in every five – lived in abject poverty. More than 500 million people were getting less than 80% of the recommended intake of calories; during the hour or so that it takes for us to eat our Thanksgiving Day meal, more than 1,600 people (mostly children) die of hunger. Moreover, our efforts to feed those people are damaging the environment: we're quickly losing topsoil and are polluting the soil and water with herbicides and insecticides. As we bring more land into cultivation, we destroy habitats and threaten many native species of plants and animals. Earth cannot continue to support such an increasing population.

Our rapidly growing population, combined with ineffective governmental policies and food-distribution methods, has overwhelmed our agricultural system. Solving this problem is a tremendous – perhaps impossible – challenge. However, all hope is not lost.

wheat [wɪ:t] – пшеница;

high-yielding crops – высокоурожайные сельскохозяйственные культуры;

to keep up with – не отставать;

to claim [kleɪm] – утверждать;

hunger [ʌŋɡə] – голод;

to pollute [pə'lu:t] – загрязнять;

to threaten [θreɪn] – грозить, угрожать;

challenge [tʃælɪndʒ] – сложная задача, проблема;

in abject poverty – в крайней нищете;

havoc ['hævək] – разрушение, опустошение.

II. THE MOST PROMISING TOOLS FOR HELPING TO FEED THE WORLD

Biotechnology is being hailed as the “second green revolution” that will produce plants that protect and nourish themselves and, in the process, help feed the world.

Other botanists are now using genetic recombination to create high-yielding crops that resist disease, drought, and pests. Still others are improving the caloric and nutritional value of crops. In years ahead, genetically engineered plants will become a leading source for increasing food production. However, biotechnology is not the only tool in the war on hunger.

Another strategy to increase our supply of plant foods is to look for new crops among the many naturally occurring plants. Fewer than 30 of the 240,000 species of flowering plants provide more than 90% of plant-based foods eaten by people. One of the most promising plants that botanists are studying as a new source of food is the majestic-looking *amaranth*, a member of the pigweed family. These plants stand about 8 feet tall and have broad purplish green leaves and massive seed heads. Each plant produces about a half million mild, nutty-tasting, protein-rich seeds, each the size of a grain of sand. The flowers are a vivid purple, orange, red, or gold. Interestingly, amaranth was cultivated extensively in Mexico and Central America until the arrival of the Spanish conquistadors in the early 1500s, who banned the plant from use a crop because of its importance in the Aztec religion.

Amaranth is being grown experimentally at the Rodale Research Center in Kutztown, Pennsylvania. It grows rapidly, can tolerate a wide range of environmental conditions (high salt, high acid, high alkalinity), yields many seeds, and comes in many varieties.

Nutritionally, amaranth is superb. Its seeds contain 18% protein, compared to 14% or less for wheat, corn, and rice. Amaranth is rich in amino acids that are poorly represented in the major cereals. The seeds can be used as a cereal, a popcorn like snack, and a flour to make graham crackers, pasta, cookies, and bread. The germ and bran together are about 50% protein, making them ideal to add to prepared foods and animal feeds. The broad leaves of amaranth are rich in vitamins A and C as well as the B vitamins riboflavin and folic acid. They can be cooked like spinach or eaten raw in salad.

Botanists are also studying a variety of spinach-like plants as new sources of food. Other plants studied as potential sources of food include *saltbush* and *ironweed*, both of which contain much protein. These plants grow well in harsh conditions (salty soil, hot weather) and are a promising source of food for livestock.

Botanists have also established gene banks and pollen banks to help conserve rare plants and to increase the world food supply.

to hail [heɪl] – приветствовать;
drought [draʊt] – засуха;
pest [pest] – с.-х. вредитель;
nutritional values – пищевая ценность;
pigweed [ˈpɪɡwi:d] – *бот.* марь, амарант;
nutty-tasting – имеющий вкус ореха;
to ban [bæŋ] – наложить запрет, запрещать;
cereal ['sɪəriəl] – (обычно pl.) хлебный злак;
bran [bræn] – отруби, высевки;
spinach ['spɪnɪdʒ] – шпинат;
live stock [laɪv] [stɒk] – домашний скот.

Exercise 1. Translate the word combinations from Russian into English.

I. Начал создавать новые разновидности растений; производство увеличилось в 4 раза; подобные успехи были достигнуты; скорее не за технологию, а за свой гуманизм; удовлетворить все возрастающие потребности в пище; в действительности усугубила проблему; последствия разрушительны; рекомендуемое потребление калорий.

II. Высокоурожайные сельскохозяйственные культуры; станут основным источником увеличения производства продовольствия; одно из наиболее многообещающих растений; который запретил использовать растение в пищу; может приспособиться к большому разнообразию факторов внешней среды; зародыши вместе с отрубями содержат около 50% белка; изучают большое разнообразие растений родственных шпинату; хорошо растут в сырых (неблагоприятных) условиях; создавать банк генов и пыльцы; сохранять редкие растения.

Exercise 2. State the following as True or False:

1. Borlaug achieved remarkable results by creating new varieties of plants in 1940.
2. Borlaug received a Nobel Prize in 1970 for technology that produced the high-yielding crops.
3. The Green revolution and similar programs have eliminated world hunger.
4. Efforts to feed people results in pollution of the environment.
5. Biotechnology will produce plants that protect and nourish themselves.
6. Genetically engineered plants will become a source for increasing food production.
7. Мо
8. More than 30 of the 240,000 species of flowering plants provide more than 80% of plant-based food eaten by people.

9. Amaranth one of the most promising plants is being grown experimentally at the Rodale Research Center in Pennsylvania.
10. Botanists are also studying a variety of spinach-like plants as new sources of food.

Exercise 3. Answer the following questions:

I.

1. What is the main task which the botanists try to solve at the present time?
2. What scientist began creating new varieties of plants in 1944 and achieved remarkable results?
3. What for did Borlaug receive a Nobel Prize in 1970.
4. What did critics of the “Green revolution” claim?
5. What are the consequences of world overpopulation?

II.

6. Why is biotechnology being hailed as the “second green revolution”?
7. What is biotechnology?
8. What techniques are botanists using now to create high-yielding crops?
9. What are the advantages of genetic recombination?
10. What can you say about another strategy to increase our supply of plant foods?

Exercise 4. 1) Name some of the most promising plants that botanists are studying as a new source of food.

2) Give facts to prove that amaranth is one of the most promising plants, taking into account:

- a) the production of seeds;
- b) its growth;
- c) tolerance of environmental conditions;
- d) its nutritional values.

FEEL BETTER NATURALLY

Read and memorize new words and word combinations from the text:

1.	to down	- снижать;
2.	nutritional supplements	- питательные добавки;
3.	natural remedies	- природные лекарства;
4.	benefit	- польза, выгода;
5.	clinical trials	- клинические испытания;
6.	supervision	- наблюдение;

7.	health-food shops	- магазины натуральной пищи;
8.	to boost	- стимулировать;
9.	cautious	- осторожный, осмотрительный;
10.	to clump	- собирать в кучу.

Read the text and do exercises that follow it.

FEEL BETTER NATURALLY

By Anita Bartholomew

To keep yourself fighting fit delve into nature's medicine chest

Britons are downing a record number of nutritional supplements, spending more than £ 1 billion a year. Researchers maintain that you should get most of your nutrients from a well-balanced diet. But they also say that there may be real benefits to some natural remedies. Here are some of the most promising:

A. St John's Wort

What it is: The wild variety of this herb, which is available in most health-food shops, has been used for centuries to calm the mind and heal the body.

What it does: St John's Wort is an antidepressant, effective for about two-thirds of those who try it. It has been prescribed by doctors in Germany for many years. Last year the British Medical Journal published an analysis of 23 clinical trials of the herb. It found that St John's Wort was effective for patients with mild moderate depression. In addition, fewer patients using the herbal remedy reported minor side-effects than those taking prescription medicine.

Who should take it? If you have been feeling 'down' for a while, you might consider St John's Wort. Though the herb is sold without a prescription, experts agree that it should be taken under a doctor's supervision- especially if you have been taking an antidepressant or any other prescription drug. High doses of the drug may also cause sun sensitivity.

B. Pycnogenol and C. Grape-Seed Extracts

What they are: While these two herbal products come from different plants – Pycnogenol [jeh-NAH-nal] is a registered brand name made from French Maritime pine bark; the other comes from grapes – each is a rich source of flavonoids, antioxidants protecting against free radicals that damage cells and tissue.

What they do: Flavonoids, which occur naturally in fruit and vegetables, work to keep cells healthy. Some doctors say that Pycnogenol and grape-seed extracts seem to ease the symptoms of inflammatory diseases and relieve allergies. And

in a yet-to-be published study of the effects of Pycnogenol on young smokers, it reduced blood platelet clumping, a dangerous artery-clogging effect of smoking. **Who should take them?** If you don't always eat the recommended five servings a day of fruit and vegetables, you might consider taking one of these extracts.

D. Garlic

What it is: A member of the onion family, it has been used as a medicinal herb since the time of the ancient Egyptians.

What it does: European studies show that in cultures where people eat lots of garlic, there are fewer incidences of gastric cancer, high blood pressure and high cholesterol.

Dr George Lewith, Director of the Centre for the Study of Complementary Medicine, adds that garlic appears to 'boost the immune system and help fight infection by increasing the activity of immune cells'. It also has antibacterial properties from a sulphur containing compound called allicin, formed when garlic is crushed or sliced.

Cooking or processing eliminates allicin, but experts say that standardized garlic powders can form allicin when consumed. Garlic has many beneficial compounds. That's why deodorized garlic tablets and extracts seem to work as well as the raw herb in reducing cholesterol.

Who should take it? Unless you're allergic, you really can't go wrong by adding this herb to your diet. If you dislike the taste, garlic tablets will provide most of the health benefits without the flavor or odour.

E. Echinacea

What it is: This flowering herb was, in great grandmother's day, found in many medicine cabinets. Echinacea [EK-in-EH-shia] fell out of favor with the introduction of antibiotics, but now it's making a comeback.

What it does: The herb has a mild protective effect against colds and flu, and in those who do fall it seems to limit the duration and severity of the symptoms.

One study found that those with the lowest levels of white blood cells got the most benefit, which supports the theory that Echinacea boosts the immune system by coaxing the body to produce more of these cells.

Who should take it? Although it doesn't work for everyone, Echinacea is safe to try when you feel a cold or flu coming on.

However, unless directed by a doctor, people with autoimmune disorders should avoid it. Look out for tincture or capsules, and follow label instructions and if you are allergic to flowers in the daisy family, you should be cautious.

F. Zinc

What it is: An essential trace mineral. Some of the richest natural sources are shellfish and red meat.

What it does: A study at the Cleveland Clinic in America showed that after sucking on zinc lozenges, cold sufferers got better faster than those given a sugar pill. The zinc group suffered coughing, headaches and nasal congestion for four days; those who got a sugar pill stayed stuffed up for more than a week.

Who should take it? Most adults can safely take zinc lozenges to limit a cold's duration-one lozenge every four hours. Make sure the label says zinc gluconate - it is released readily into the mouth – not zinc aspartate or zinc citrate. But be cautious: too much will depress your immune system, and zinc should be avoided at daily doses above 30 milligrams.

G. Omega-3 Fatty Acids

What they are: These are fats and oils essential to cardiovascular health and brain development. Sources include fish oil, flaxseed oil green leafy vegetables.

What they do: Omega-3 fatty acids reduce the risk of cardiovascular disease by lowering triglyceride levels and blood pressure, by reducing platelet clumping that can lead to blockages and, in some cases, by lowering cholesterol. A US National Heart, Lung and Blood Institute study suggests that men who get a half gramme of these fatty acids per day can cut their risk of dying of heart disease by up to 40 per cent.

Who should take them? Everyone should include Omega-3 fatty acids in their diet, especially people with a family history of heart disease or high blood pressure. The best source is fresh fish. Ask your doctor before taking fish-oil supplements.

Exercise 1. Find in the text the English equivalents to the following words and word combinations:

получать большинство питательных веществ; хорошо сбалансированное питание; реальная польза от природных лекарств; доступны в большинстве магазинов натуральных продуктов; успокаивать разум и исцелять тело; незначительные побочные эффекты; под наблюдением доктора; облегчать симптомы воспалительных заболеваний; стимулировать иммунную систему; подавлять иммунную систему; возвращаться; уменьшать длительность и серьезность симптомов; когда простуда или грипп наступают; иметь аллергию на

Exercise 2. Agree or disagree with the following statements. Use the following phrases while answering:

I think it's true...; That's quite right...; I don't think it's true...; I am afraid it's wrong.

1. People who take St. John's Wort have more side-effects than those taking prescription medicines.
2. Garlic appears to depress the immune system by decreasing the activity of immune cells.
3. It's rather possible to take St. John's Wort without doctor's supervision.
4. If you are allergic you won't be mistaken by adding garlic to your diet.
5. High doses of St. John's Wort may cause cold sensitivity.
6. Pycnogenol and grape-seed extracts ease symptoms of inflammatory diseases and relieve allergies.
7. Grape-seed extracts also decrease blood platelet clumping in smokers.
8. Echinacea fell out of favor with the introduction of antibiotics, but now it is making a comeback.
9. People with autoimmune disorders should take Echinacea.
10. Deodorized garlic tablets are not as effective as the raw herb in reducing cholesterol.
11. Too much zinc can depress the immune system.
12. Omega-3 fatty acids should be avoided by the people with a family history of heart diseases or high blood pressure.

Exercise 3. Define which of the natural medicinal substances are described below. In some cases more than one answer can be possible:

- A. St. John's Wort
- B. Pycnogenol
- C. Grape-seed extracts
- D. Garlic
- E. Echinacea
- F. Zinc
- G. Omega-3 fatty acids

1. seems to help people recover from colds more quickly?
2. is believed by some doctors to help allergy sufferers?
3. has been tested in the USA?
4. shouldn't be taken without medical supervision?
5. can be found in cabbages and cauliflowers?
6. is completely safe to take if you are allergic to it?
7. reduces the risk of heart diseases?
8. is recommended for treating depression?
9. seems to boost the immune system?
10. may be helpful for cigarette smokers?
11. has been used for many hundreds of years?

12. can be found in shellfish and beef?
13. is more popular now than it was in the past?
14. may have harmful side-effects if taken in large doses?

Exercise 4. Answer the following questions:

1. What do the British researchers maintain?
2. What for has St. John's Wort been used for centuries?
3. What are the main medicinal properties of St. John's Wort?
4. What side effects can be caused by St. John's Wort?
5. What is Pycnogenol made from?
6. Pycnogenol and grape-seed extracts are antioxidants, aren't they? How do they act?
7. What therapeutic effects have Pycnogenol and grape-seed extracts?
8. Where else can flavonoids be found?
9. What have European studies of garlic shown?
10. How does garlic influence the immune system?
11. What is allicin and what are its properties?
12. Why did Echinacea fall out of favor?
13. In what cases can Echinacea be used?
14. What are the main natural sources of zinc?
15. How does zinc help those, who suffer from cold?
16. In what products can Omega-3 fatty acids be found?
17. Why are Omega-3 fatty acids so essential?
18. How do Omega-3 fatty acids influence the cardiovascular system?

HERBS

Read and memorize the words.

1.	meadow ['medou] <i>n.</i>	- луг, луговина;
2.	permeate ['pə:miət] <i>v.</i>	- пропитывать; проникать, проходить сквозь;
3.	superstition [,sju:pə'stiʃən] <i>n.</i>	- суеверие, религиозный предрассудок;
4.	claim ['kleim] <i>n.</i>	- утверждение, заявление;
5.	delay [di'lei] <i>v.</i>	- задерживать, отсрочивать, откладывая;
6.	rauwolfa [rɔ:'wɔlfia]	- <i>p.</i> змеиная раувольфия;
7.	ailment ['eilmənt] <i>n.</i>	- недомогание, нездоровье;

		болезнь;
8.	caution ['ko:ʃən] <i>n.</i>	- осторожность; предостережение, предупреждение;
9.	deleterious [,delɪ'tɪəriəs] <i>adj.</i>	- вредный, пагубный;
10.	rash [ræʃ] <i>n.</i>	- сыпь, высыпание;
11.	dizziness ['dɪzɪnɪs] <i>n.</i>	- головокружение;
12.	faint [feɪnt] <i>v.</i>	- падать в обморок, терять сознание; ослабевать;
13.	discard [dɪs'kɑ:d] <i>v.</i>	- отбрасывать, отвергать, отказываться;
14.	golden-seal [gould(ə)n' si:l] <i>n.</i>	- бот. «золотая» печать, желтокорень канадский;
15.	deterioration [dɪ'tɪəriə'reɪl(ə)n] <i>n.</i>	- ухудшение; повреждение.

Read the text and do exercises that follow it.

HERBS

In meadows, prairies, and wildwoods, people for centuries have been collecting herbs to use as medicine. Vast amounts of information have been collected and tested; much of this information had never been written down, but had been passed on verbally instead. A disadvantage of most archaic theory is that it is permeated with magic, superstition, and dogma that is, for all practical purposes, irrelevant. Many Renaissance herbalists recorded information from ancient herbalists such as Pliny or Dioscorides without testing the ancients' claims, thus preserving statements that were to cast a suspicious light over the rest of the Renaissance findings about herbs.

Walter Lewis, professor of biology at Washington University in St. Louis, Missouri, states that the approach to research since the synthetic era, with little regard for past data, "... has served to delay the application of many potential benefits. For example, it is unfortunate that man's first cosmopolitan tranquilizer derived from rauwolfia did not come into general use until 1952, despite the long history of its use in Ayurvedic medicine in India, or that cromolyn, the miraculous prophylactic drug for asthma, has only recently been introduced, though its use in the form of ammi seeds was part of Bedouin folk medicine for centuries."

Pharmaceutical companies have begun to search for plants that can cope with the diseases that are associated with our modern life-style. Stress, coronary disease, ulcers, rheumatism, and other ailments have already yielded to the power of plants. Even antitumor properties have been found in several species.

There may be a word of caution to the chemist who first isolates the beneficial substance and leaves the rest of the root, bark, stem, leaf, or flower

behind. This purified chemical may act favorably on a particular part of the body, but may also have deleterious effects on other parts of the body. Side effects may include rashes, dizziness, fainting, palpitations, blurred vision, diarrhea, or depression. The constituents of the plant that were discarded in the laboratory may have an inherent balancing or modifying mechanism that exerts control over the active principle. Both digitalis and rauwolfia have recently been shown to be of greater benefit when the whole part of the plant involved was taken.

The exact reason for the positive effect that herbs exert on the human body is not always known. It is evident, however, that the nutrients stored within the plants' cellular structure are in forms that are easily metabolized by the gastric juices, enzymes, and hormones of the body. The therapeutic action of herbs comes from alkaloids, organic nitrogenous compounds that cause certain chemical reactions within the body. Herbs also contain minerals, vitamins, and salts that help the body to resist disease, strengthen tissues, and improve the nervous system. They also contain glycosides, which are important sugars for the proper functioning of the heart and bloodstream. Tannins present in herbs aid recovery from illness by preventing passage of harmful bacteria. Plant mucilage can assist in the proper functioning of the intestines.

In order to receive the beneficial effects that can be obtained from herbs, the herbs must be consumed regularly for long periods of time, sometimes indefinitely. There are exceptions, such as golden seal, which if taken too long can retrogress the illness. Herbs should be kept in air-tight containers away from heat, light, and dampness to prevent deterioration of their active ingredients.

There are hundreds of herbs available, about which information can be found in the many books written exclusively about this subject. Herbs can be obtained from health-food stores, from herbalists, from homeopathic pharmacies, and from some food markets.

Exercise 1. Find in the text English equivalents to the following Russian word combinations:

передавать устно; бросать тень на что-либо/ кого-либо; справиться с болезнями, связанными с современным образом жизни; поддаваться/ отступать перед силой; оказывать благоприятное воздействие на ...; побочное действие; осуществлять контроль над активным составным элементом (частью); желудочный сок; способствовать исцелению/ излечению от болезни; положительное воздействие; усугубить болезнь; хранить в герметических контейнерах.

Exercise 2. *Agree or disagree with the following statements:*

1. Renaissance herbalists failed to record information from ancient herbalists such as Pliny and Dioscorides.
2. Cromolyn, the miraculous prophylactic drug for asthma has only recently been introduced.
3. Both digitalis and rauwolfia have recently been shown to be of greater benefit when only their leaves were taken.
4. The exact reason for the positive effect that herbs exert on the human body is always evident.
5. Herbs contain minerals, vitamins, and salts that help the body to resist disease, strengthen tissues, and improve the nervous system.
6. To receive the beneficial effects that can be obtained from herbs, the herbs must be consumed regularly for long periods of time, sometimes indefinitely.
7. Herbs should be kept on the open shelves unprotected from light.
8. There are hundreds of herbs available, but the information about them can nowhere be found.

Exercise 3. *Answer the following questions:*

1. For how long have people been collecting herbs in meadows, prairies, and wildwoods to use them as medicine?
2. What disadvantage of most archaic theory is mentioned in the text?
3. What plants have pharmaceutical companies begun to search for?
4. In what forms are the nutrients, stored within the plant's cellular structure?
5. What does the therapeutic action of herbs come from?
6. Do tannins present in herbs aid recovery from illness by preventing passage of harmful bacteria?
7. How should herbs be kept to prevent deterioration of their active ingredients?
8. Are there many herbs available for use?
9. Where can people obtain herbs nowadays?

Exercise 4. *Comment upon these tips concerning the use of herbs:*

- Mind that herbs are not intended to replace the services of physicians.
- If a herb does not agree with you or if you feel adverse effects, discontinue using the herb and find one that does agree with you.
- Herbs can be potent. Practice moderation. Adverse side effects are possible with many herbs when they are taken in overdoses.

Exercise 5. *Read the texts below. Pay attention to medicinal use of the herbs described in them.*

ALFALFA (Medicago sativa)

Medicinal Use

Mild laxative, tonic, stomachic, diuretic.

Comments

Centuries ago, the Arabs used alfalfa as feed for their horses, because they claimed that it made the animals swift and strong. They then tried the herb themselves and became so convinced of its benefits to their health and strength that they named the grass “Al-Fal-Fa,” which means “Father of All Foods.”

The roots of the alfalfa plant burrow deep into the earth to reach minerals that are inaccessible to most other plants. Alfalfa contains vitamins A, E, K, B and D. It is high in protein and contains phosphorus, iron, potassium, chlorine, sodium, silicon, magnesium, and other trace elements. Alfalfa has eight enzymes known to promote chemical reactions that enable food to be assimilated properly within the body.

Alfalfa has been effective for aiding stomach ailments, gas pains, ulcerous conditions, dropsy, and pain and stiffness of arthritis. It may help cure peptic ulcers, and help in treating recuperative cases of narcotic and alcohol addiction and also in treating cases of overweight.

Alfalfa herb tea is said to possess no unfriendly components and may be given to children and adults of all ages. It is good for nursing mothers and for others who wish to abstain from beverages that contain caffeine. The tea is especially pleasant when it is combined with a mint-flavored herb.

ANGELICA (Angelica archangelica)

Medicinal Use

Aromatic, stimulant, carminative, diuretic, diaphoretic, emmenagogue, tonic, expectorant, stomachic.

Comments

It is thought by many that angelica derived its botanical name, *Angelica archangelica*, from its blooming date, May 8, which used to be the day of Michael the Archangel. In eighteenth-century Europe, giving a bouquet of angelica to one who was dearly loved meant “you are my inspiration.”

Angelica has been used as a remedy for stomach problems such as sour stomach, heartburn, gas or colic, and for colds, coughs, shortness of breath, and fever. It may be good for sluggish liver and spleen, rheumatism, and nervous headache. It is useful for ulcers (taken internally and tea-dropped externally), because it restores normal tissues. Because of its unique ability to clear tiny passages, angelica has been used to relieve dimness of vision and of hearing by

placing drops of the tea into the eyes and ears. Large doses may have a positive effect on blood pressure, heart action, and respiration. In Eurasia, angelica is considered a tonic to improve well-being and mental harmony. In England, the plant juice has been placed into carious teeth, and the oil has been used in dental preparations. Angelica salve applied externally is beneficial as a skin lotion and for relief of rheumatic pains. A decoction can be applied to the skin for itching and wounds. As a compress it is helpful for gout. Angelica has a tendency to increase the sugar in the urine, so those with diabetes or with diabetic tendencies should avoid it.

The dried leaf stalks of angelica are often preserved with sugar, thus forming a confection (also known as angelica) that is used in sweetmeats and cake decorations. In Iceland, both stems and roots are eaten raw with butter. The Norwegians make bread with the roots, and in Lapland the stalks are regarded as a delicacy. As a bath additive, it is soothing to the nerves.

CHAMOMILE (Anthemis nobilis)

Medical Use

Stomachic, antispasmodic, tonic, emmenagogue, stimulant, tonic, aromatic, anodyne, vermifuge.

Comments

Chamomile is widely known for its applelike fragrance and flavor. It derives its name from the Greek *kamai* ((on the ground) and *melon* (apple), for “ground apple.”

Chamomile may relieve upset stomachs, colds, bronchitis, bladder troubles, dropsy, and jaundice. Intermittent and typhoid fever may be broken in the early stages through ingestion of the tea. It is helpful in regulating the menstrual cycle, rheumatic pains, headaches, and hysteria. It has been traditionally used as a sleep inducer and mild sedative. In Italy, a million cups of chamomile are drunk each day, and an Italian company now markets it under the slogan “cup of serenity.” It is effective for colic in infants and is a good remedy for a child’s fever and restlessness. The tea can be used as a wash for sore or weak eyes and for open sores and wounds, as a gargle, and as a poultice for pains and swellings. A chamomile poultice is helpful in preventing gangrene. When sponged over the body and left to dry, the tea acts as an insect repellent.

The dried leaves and flowers have for centuries been used as a hair rinse for blond hair, as an additive for baths, and as a scent among linen.

EUCALYPTUS (Eucalyptus globulus)

Medicinal Use

Antiseptic, antispasmodic, stimulant, expectorant, aromatic.

Comments

The leaves and oil from this tree are an extremely potent but safe antiseptic, which results from the antimicrobial properties of one of their constituents, eucalyptol. An infusion is good for scarlet, typhoid, and intermittent fevers; and for indigestion. It is soothing to inflamed mucous membranes; thus it is a relief for asthma and croup. The oil may be applied locally for ulcers, growths, wounds, sores, neuralgic or rheumatic pains, pyorrhea, and burns. When inhaled, eucalyptus is valuable for treating asthma, diphtheria, sore throat, and stuffy nose. A solution of 1 teaspoon of oil to 1 cup of warm water may be rubbed into the skin as an effective insect repellent. The oil may be taken internally in small doses only. Excessive doses of eucalyptus may produce digestive disturbances, nausea, vomiting, diarrhea, kidney irritation, muscular weakness, and related effects.

Eucalyptus is a major ingredient in many commercial medicines such as cough and sore throat lozenges, nasal sprays, and chest rubs. A facial steam that is made with the leaves or oil in a pot of boiling water, and inhaled with a towel placed over the head, is effective for relieving congestion. This same water can be poured on sauna rocks. Eucalyptus tea or oil can also be put into the bath.

PEPPERMINT (Mentha piperita)

Medicinal Use

Stimulant, stomachic, carminative, aromatic, vermifuge, anodyne, antispasmodic, cholagogue, tonic.

Comments

According to the Greek philosopher-scientist Theophrastus, 300 B.C., the botanical name *mentha* was derived from Greek mythology. Mintho was a beautiful nymph who was loved by Pluto, god of the underworld. Persephone, who had been abducted by Pluto to reign with him over his domain, became jealous of Mintho and changed her into a fragrant and lowly plant, the mint.

Peppermint is one of several mints within the mint family. All mints are said to strengthen the stomach and improve digestion. The pleasant aroma is soothing and invigorating. Peppermint is used against liver complaints, flatulence, nausea, seasickness, vomiting, chills, colic, fevers, dizziness, diarrhea, dysentery, cholera, influenza, and such heart problems as palpitations. It may be helpful in cases of insanity, convulsions and spasms in infants, and

nervous headache. Peppermint cleanses and strengthens the entire system, including the nerves. It diffuses like alcohol and warms the whole body.

The herb tea is an excellent substitute for coffee or tea. The oil of peppermint when applied externally is useful for toothache, headache, neuralgia, burns, and rheumatism. A peppermint salve helps skin conditions. When placed in the bath, peppermint can have a calming and strengthening effect on the nerves and muscles.

ROSE HIPS

Comments

Hips are the fruit of the rose, or what is left after the flower has bloomed and the petals have fallen. The ancient Greeks used the fresh hips as a food, and 1000 years before Christ, hips were referred to as the “Food of the Gods.” “Gods” were believed to be men who lived so close to nature that nature whispered her secrets to them.

During World War II, the governments of England, Sweden, and Norway discovered that rose hips contained from ten to one hundred times more vitamin C than any other food. They also contain vitamins A, E, B₁, B₂, K, P, niacin, and the minerals calcium, phosphorus, and iron. Rose hip tea may be beneficial for the bladder and kidneys, and helpful in preventing colds.

HAWTHORN (Crataegus oxyacantha)

Medicinal Use

Tonic, antispasmodic, sedative, vasodilator.

Comments

A yellow substance from the hawthorn was isolated by Ullsperger, who found that it caused the dilation of the coronary vessels. Fasshauer reported that 100 heart patients who required continual therapy were given the liquid extract of hawthorn. The results were generally beneficial. Marked improvement was shown in patients with mitral stenosis and heart diseases of old age. For other patients who used hawthorn, digitalis could be either temporarily discontinued or considerably reduced. Scientific investigation has also found hawthorn to be helpful for insomnia, for alleviating irregular heart rhythm, and for a variety of other heart ailments, including angina pectoris. It has been used to treat high blood pressure when taken over a period of time, arteriosclerosis, inflammation of the heart muscle (myocarditis), arthritis, and rheumatism. It may be effective for alleviating nervous conditions and stress from daily pressure. Although hawthorn is nontoxic, large doses can cause dizziness

LICORICE (Glycyrrhiza glabra)

Medical Use

Demulcent, pectoral, emollient, expectorant, laxative, diuretic.

Comments

Archeologists have found great quantities of licorice stored among other treasures in the 3000-year-old tomb of King Tut-Ankh-Amen of Egypt. The practice of placing this herb in the tombs was instituted to enable the spirit of the deceased person to make a sweet drink in the next world.

Licorice has been used for centuries as a confection, and because of its saponin content, it is an effective soother of various internal pains. It is helpful for alleviating such ailments as inflamed stomach, bronchitis, sore throat, coughs, irritations of the bowel and kidney, and indigestion. In Denmark, experiments have shown licorice to be very effective for treating duodenal and peptic ulcers. It also contains a female hormone that has estrogenic action. Southern Europeans drink large amounts of licorice water, because they believe it to be a blood purifier. The Romans thought so highly of its medicinal value that it was included in the rations of the Roman legions. The licorice root has a substance known as glycyrrhizin, which is fifty times sweeter than sugar cane. Despite this fact, it alleviates rather than increases thirst.

Licorice can be added to other, less pleasant-tasting herbs to make them more palatable. Licorice root sticks can be sucked on by persons who wish to stop smoking. Excessive licorice intake can lead to cardiac dysfunction and hypertension.

YARROW (Achillea millefolium)

Medicinal Use

Diaphoretic, stimulant, tonic, astringent, alterative, vulnerary, diuretic.

Comments

Yarrow gets its botanical name *Achillea* from the legend that comrades of the Greek hero Achilles used yarrow to heal their wounds during the Trojan War. The name *millefolium* was taken because of yarrow's feathery leaves, which are so well divided that the plant appears to have a thousand leaves. Yarrow has a healing and soothing effect on the mucous membranes. It may be effective for treating bleeding from the lungs and urinary organs, diabetes, bleeding hemorrhoids, dysentery, and stomach disorders. It is helpful with typhoid and other fevers, colds, diarrhea, measles, smallpox, chicken pox, Bright's disease, colic, rheumatism, constipation, toothache, and earache. It is very good when

applied externally as an ointment for cuts and wounds. Yarrow can also be used as a douche for leucorrhoea and as an enema for hemorrhoids.

DANDELION (Taraxacum officinale)

Medicinal Use

Diuretic, tonic, slight aperient, hepatic, depurative, stomachic, cholagogue.

Comments

Dandelion has a high vitamin and mineral content.

It is very useful for treating kidney and liver disorders, and helpful with jaundice, skin diseases, scrofula, and loss of appetite. It is useful for treating dropsy, fever, inflammation of the bowels, infectious hepatitis, edema resulting from liver problems, rheumatism, gout, and stiff joints. Dandelion increases the activity of the liver, pancreas and spleen. Based on a compilation by Dr. Norman Farnsworth, professor of pharmacognosy at the University of Illinois in Chicago, dandelion has been shown to contain insulin substitutes that are needed by diabetics. The Chinese use a dandelion poultice for snake bites. The milky juice can be applied daily to warts.

Young dandelion leaves can be used in salads. The larger leaves can be cooked as a vegetable. Dandelion wine is made from the flowers, and the roots are dried and ground to make a coffee substitute.

HERB GLOSSARY

ALTERATIVE Gradually altering or changing a condition, also a blood purifier.

ANODYNE Relieving pain.

ANTIPERIODIC Preventing the periodic return of certain diseases.

ANTISEPTIC Destroying infection-causing microorganisms.

ANTISPASMODIC Relieving or preventing involuntary muscle spasms or cramps.

APERIENT Mild and gently acting laxative.

AROMATIC Substance with a spicy scent and a pungent but pleasing taste. Useful for fragrance, and often added to medicines to improve their palatability.

ASTRINGENT Temporarily tightening or contracting the skin or tissues. Checks the discharge of mucus and blood, etc.

CARMINATIVE Checking formation of gas and helping to dispel whatever gas has already formed.

CHOLAGOGUE Promoting the discharge of bile from the system.

DEMULCENT Mucilaginous substance that soothes the intestinal tract.

DEOBSTRUENT Clearing obstruction from the natural ducts of the body.
DEPURATIVE Removing wastes from body, purifying blood.
DETERGENT A cleansing action.
DIAPHORETIC Promoting sweating. Commonly used as an aid for relief of the common cold.
DIURETIC Promoting flow of urine.
EMMENAGOGUE Promoting menstruation.
EMOLLIENT Softening and soothing skin when applied externally.
EXPECTORANT Loosening phlegm in the mucous membrane of the bronchial and nasal passages, thus facilitating its expulsion.
HEMOSTATIC Checking internal bleeding.
HEPATIC Affecting the liver.
LAXATIVE A gentle cathartic that helps to promote bowel movements.
MUCILAGINOUS A soothing quality for inflamed parts.
NERVINE Calming nervous irritation from excitement, strain, or fatigue.
PECTORAL Relieving ailments of the chest and lungs.
REFRIGERANT Generally cooling in effect, also reduces fevers.
SEDATIVE Calming the nerves.
STIMULANT Increasing or quickening various functions of the body, such as digestion and appetite. It does this quickly, whereas a tonic stimulates general health over a period of time.
STOMACHIC Strengthening and toning the stomach and stimulating the appetite.
TONIC Invigorating or strengthening the system.
VASODILATOR Widening blood vessels.
VERMIFUGE Destroying and helping to expel intestinal worms.
VULNERARY Application for external wounds.

UNIT III. GREAT SCIENTISTS

VACCINATION FOR SMALLPOX

Read and memorize the words.

1.	apprentice [ə'prentɪs] <i>n.</i> , <i>v.</i>	- ученик, подмастерье; - отдавать в учение;
2.	acquire [ə'kwɪə] <i>v.</i>	- приобретать;
3.	plague [pleɪg] <i>v.</i>	- насылать бедствие, мучить;
4.	to contract a disease	- заболеть;
5.	susceptible [sə'septəbl] <i>a.</i>	- восприимчивый;
6.	scab [skæb] <i>n.</i>	- струп (на язве), парша, короста;
7.	cow-pox ['kaʊpɒks] <i>n.</i>	- коровья оспа;
8.	smallpox ['smɔ:lɒks] <i>n.</i>	- ветряная оспа;
9.	measles ['mi:zlz] <i>n.</i>	- корь;
10.	tetanus ['tetənəs] <i>n.</i>	- столбняк;
11.	quest [kwɛst] <i>n.</i>	- поиск;
12.	eliminate [ɪ'lɪmɪneɪt] <i>v.</i>	- уничтожать, ликвидировать;
13.	eradication [ɪ,rædɪ'keɪʃən] <i>n.</i>	- искоренение, уничтожение.

Read the text and do exercises that follow it.

VACCINATION FOR SMALLPOX

Edward Jenner, the discoverer of vaccination for smallpox, was born at a time when the patterns of British medical practice and education were undergoing gradual change.

Jenner was a country youth, the son of a clergyman. Because Edward was only five when his father died, he was brought up by an elder brother who was also a clergyman. Edward attended grammar school and at the age of 13 was apprenticed to a nearby surgeon. In the following eight years Jenner acquired a sound knowledge of medical and surgical practice that helped him much in his future work. On completing his apprenticeship at the age of 21, he went to London and became the house pupil of John Hunter, who was on the staff of St. George's Hospital and was soon to become one of the most prominent surgeons in London.

Of the many diseases that plagued societies for centuries, smallpox was among the most serious. Numerous individuals contracted and died of this viral disease. Those who survived, however, no longer seemed to be susceptible.

They had become resistant to infection with the smallpox virus. Even without any knowledge of the immune response, some individuals reasoned that it was possible to acquire immunity (resistance to disease). In China, where many herbs and other substances were long used to treat disease, children inhaled dried scabs from smallpox victims to protect them against serious smallpox infections. Those that developed mild cases of smallpox and survived were subsequently resistant (immune) to this disease. This practice was carried out as early as the thirteenth century and, by the early eighteenth century, individuals throughout the Far East were exposing themselves to smallpox viruses to develop immunity.

Jenner, even as an apprentice, had been impressed by the fact that a person who had suffered an attack of cowpox, a relatively harmless disease that could be contracted from cattle, could not take the smallpox, that is could not become infected whether by accidental or intentional exposure to the smallpox. He clearly knew of the dairy country's folk belief that cowpox, which is caused by vaccine virus, protected its victims from subsequent infections of smallpox.

His June 1798 report, *An Inquiry into the Causes and Effects of the Variolae Vaccine*, describing the value of vaccination with cowpox as a means of protecting against smallpox established the basis for the immunological prevention of disease. His work met the criteria of the scientific method: his hypothesis had been experimentally tested by observations of control and experimental groups, and it was also repeatable by others. Immunization had gained scientific credibility; medical practice and the quest to eliminate smallpox had taken a giant step forward.

Jenner, although he received worldwide recognition and many honours, made no attempt to enrich himself through his discovery and actually devoted so much time to the cause of vaccination that his private practice and his personal affairs suffered severely. In 1802 Parliament voted him a sum of £ 10,000 and in 1806 a further sum of £ 20,000. His wife, being ill with tuberculosis, died in 1815, and Jenner retired from public life.

The work begun with Jenner's discovery of the effectiveness of vaccination in preventing smallpox culminated in the 1970s with the eradication of smallpox from the face of the Earth. Today, vaccines are employed for preventing many diseases, such as tetanus, diphtheria, measles, and so forth. Research continues to develop new vaccines for preventing many other diseases.

Exercise 1. Find in the text English equivalents to the Russian word combinations:

1. приобрел глубокие практические знания по медицине и хирургии;
2. было возможно приобрести иммунитет;
3. у тех, кто переболел оспой в слабой форме и кто выжил;
4. был поражен тем фактом;

5. непреднамеренный или умышленный контакт с больными оспой;
6. как средство защиты от оспы;
7. его работа соответствовала критериям научного метода;
8. иммунизация получила научное обоснование;
9. хотя он и получил мировое признание.

Exercise 2. Agree or disagree with the following statements:

1. Edward Jenner was brought up by his father.
2. At the age of 15 he was apprenticed to a medical practitioner.
3. Smallpox was widespread for centuries and numerous individuals contracted and died of this viral disease.
4. Those that developed severe cases of smallpox became resistant to this disease.
5. In the thirteenth – eighteenth centuries individuals were exposing themselves to smallpox viruses to develop immunity.
6. Jenner's 1798 work "An Inquiry into the Causes and Effects of the Variolae Vaccine" met the criteria of the scientific method and established the basis for the immunological prevention of smallpox.
7. After receiving worldwide recognition, E. Jenner made an attempt to enrich himself through his discovery.
8. Smallpox was eradicated from the face of the Earth in 1960s.

Exercise 3. Answer the following questions:

1. What education did E. Jenner get?
2. What was one of the most serious disease that plagued societies for centuries?
3. Who usually became resistant to infection with the smallpox virus?
4. What was used in China to protect children against smallpox infection?
5. Was E. Jenner greatly impressed by the fact that there was a connection between a relatively harmless disease cowpox people suffered from and resistance to smallpox in those people?
6. What method did E. Jenner use to test his hypothesis of using vaccination with cowpox as a means of protecting against smallpox?
7. Had immunization gained scientific credibility and become general medical practice in the 18-th century?
8. E. Jenner received worldwide recognition and many honors, didn't he?
9. Why did 1802 Parliament vote Jenner a sum of \$ 10,000 and in 1806 a further sum of \$ 20,000?
10. What did the work begun with Jenner's discovery culminate in?
11. What other diseases are prevented with vaccines?

Exercise 4. Research continues to develop new vaccines for preventing many other diseases. Make your prognosis for further development of immunization techniques. What diseases would be prevented by using newly developed vaccines?

I.I. METCHNIKOFF – THE GREAT RUSSIAN BIOLOGIST

Read and memorize the words.

1.	advanced study	- курс повышенного типа для продолжающих обучение;
2.	to defend the doctor's thesis [θi:sis]	- защищать докторскую диссертацию;
3.	resign [ri' zain]	- отказываться от должности;
4.	detached [di' tæʃt]	- беспристрастный;
5.	meticulously [mi' tikjuləsli]	- дотошно, тщательно;
6.	starfish larvae ['la:vi:]	- личинки морской звезды;
7.	thorn [θo:n] <i>n.</i>	- шип;
8.	transparent [træns' pæərənt] <i>a.</i>	- прозрачный;
9.	staining [steiniŋ]	- окраска, окрашивание;
10.	penetrate ['peni'treit] <i>v.</i>	- проникать внутрь;
11.	uptake ['ʌpteik] <i>v.</i>	- поглощение, усвоение;
12.	engulf [in' gʌlf] <i>v.</i>	- поглощать.

Read the text and do exercises that follow it.

I.I. METCHNIKOFF – THE GREAT RUSSIAN BIOLOGIST

I.I. Metchnikoff was born in 1845 in the village of Ivanovka, not far from the city of Kharkoff.

Since his early childhood I.I. Metchnikoff had become interested in natural sciences. Being a pupil of the sixth form, he began to attend the course of university lectures delivered by the prominent physiologist of those days, Professor Schelckov.

When he left school he went to the University of Kharkoff to study natural sciences, and worked there so hard that he was able to complete the four year course in two years. After the graduation in 1864 he went to Germany for advanced study. Among his teachers there were Leuckart and Siebold, the famous scientists. In 1867 he returned to Russia and in 1868 defended his

doctor's thesis at Petersburg University. During 1870-1882 he was professor at Odessa University. In 1882 he resigned his post at the University in protest against the reactionary policy of the tsarist government in the field of public education. He then went to Messina to continue, in a private laboratory he set up there; his work on comparative embryology, and it was here that he discovered the phenomenon of *phagocytosis* with which his name will always be associated.

His studies were highly detailed and characterized by detached observation of his subject. He meticulously reported his microscopic observations in 1884 of what happens to a microorganism when it invades an organism. He began by examining starfish larvae stuck with thorns. He went on to examine microbial infections of *Daphnia*, a tiny freshwater organism. He infected *Daphnia* with spores of the fungus *Monospora*. This was an ideal model system because *Daphnia* is simple and transparent and *Monospora* is large and easily seen without staining. Metchnikoff was able to observe *Monospora* in the abdominal cavity of the infected *Daphnia*. He saw the fungus penetrating the *Daphnia*'s intestinal wall as a result of peristalsis. Immediately, blood corpuscles began to surround and attach themselves to the fungal spores. He observed the blood corpuscles as circulating, colorless, phagocytic cells adapted to the uptake of solid particles. The mobile cells, which he called *phagocytes*, migrated to the area of infection, where they engulfed and digested the microorganisms. In this way the phagocytes are protected against the infecting microorganisms.

Metchnikoff was able to observe and describe the changes the fungal spores underwent until they were destroyed and separated into irregular grains. He reasoned that the same processes explained how the bacterial cells that he saw inside white blood cells in the human body got there and how blood cells destroyed such bacteria. This pioneering work established the role of cellular components of the blood in destroying disease-causing microorganism and was the basis for the field of cellular immunology.

Apart from his work on phagocytosis, Metchnikoff had, during his earlier period of scientific activity, published many papers on the *embryology of invertebrates*. These included work on the embryology of Medusae. At the Pasteur Institute in Paris Metchnikoff was engaged in work associated with the establishment of his theory of *cellular immunity*, which, like many great advances in science, encountered considerable hostility. He published, during this period, several papers and two volumes on the comparative pathology of inflammation (1892), and his treatise entitled *L'Immunité dans les Maladies Infectieuses* (Immunity in infectious diseases, 1901). In 1908 he was awarded, together with Paul Ehrlich, the Nobel Prize for Physiology or Medicine. I.I. Metchnikoff performed considerable work on the effect of lactic acid on bacteria and its concentrating intestinal poisons and devoted many years of his life to the problem of aging.

Metchnikoff received many distinctions, among which were the honorary D. Sc. of the University of Cambridge, the Copley Medal of a Royal Society of which

he was a Foreign Member, the honorary memberships of the Academy of Medicine in Paris, and the Academies of Sciences and of Medicine in St. Petersburg. In addition, he was a corresponding member of several other societies and a Foreign Member of the Swedish Medical Society.

From 1913 onwards Metchnikoff began to suffer from heart attacks and, although he rallied for a time and recovered from the distress which the 1914-1918 War caused him, he died on July 16, 1916.

Exercise 1. Translate from Russian into English.

Интересоваться естественными науками; читать лекции; курс повышенного типа для продолжающих обучение; защищать докторскую диссертацию; вести научные наблюдения за; форменные элементы крови - это циркулирующие, бесцветные фагоцитирующие клетки; описать изменения, которым подверглись споры грибов; беспристрастные научные наблюдения; первым описал явление фагоцитоза; посвятить свою жизнь научным исследованиям.

Exercise 2. Define the following statements as True or False.

1. I.I. Metchnikoff had become interested in natural sciences since his childhood.
2. He began to attend the university lectures delivered by Professor Schelckov at the Petersburg University.
3. He devoted his life to research.
4. I.I. Metchnikoff carried out experiments with *Daphnia* and meticulously reported his microscopic observations.
5. His pioneering work was the basis for the field of microbiology.
6. The phenomenon of phagocytosis was described by I.I. Metchnikoff.
7. I.I. Metchnikoff devoted many years of his life to the problem of aging.
8. In 1908 he received the Nobel Prize for his work on the effect of lactic acid on bacteria.

Exercise 3. Answer the questions.

1. What was I.I. Metchnikoff?
2. What education did he get?
3. When and where did he defend his doctor's thesis?
4. Why did he resign his post at the Petersburg University in 1882?
5. What were his studies characterized by?
6. What phenomenon was he interested in?
7. What cells did he call phagocytes?
8. How did he describe the phenomenon of phagocytosis?
9. Did his pioneering work form the basis for the field of cellular immunology?

THE COLORBLIND CHEMIST

Read and memorize the vocabulary.

1.	colour-blind ['kʌlə'blaɪnd] <i>a.</i>	- страдающий дальтонизмом, не различающий цветов;
2.	amass [ə'mæs] <i>v.</i>	- собирать, накапливать, копить;
3.	affliction [ə'flɪkʃən] <i>n.</i>	- болезнь, недуг; физический недостаток;
4.	hereditary [hɪ'redɪtəri] <i>a.</i>	- наследственный;
5.	scarlet ['skɑ:lɪt] <i>n.</i>	- алый, ярко-красный цвет;
6.	attire [ə'taɪə] <i>n.</i>	- наряд, платье;
7.	cone [kəʊn] <i>n.</i>	- колбочка сетчатки;
8.	retina ['retɪnə] <i>n.</i>	- сетчатая оболочка (глаза);
9.	the perceived color	- воспринимаемый цвет;
10.	skew [sku:] <i>v.</i>	- отклоняться, искажаться;
11.	rod [rɒd] <i>n.</i>	- палочка сетчатки;
12.	cure [kjʊə] <i>n.</i>	- лекарство, средство, лечение;
13.	to handicap ['hændɪkæp] <i>v.</i>	- зд. калечить;
14.	to propound [prə'paʊnd] <i>v.</i>	- предлагать на обсуждение;
15.	to hamper ['hæmpə] <i>v.</i>	- препятствовать, мешать;
16.	to resign [rɪ'zaɪn] <i>v.</i>	- отказаться (от должности), уходить в отставку.

Read the text and do exercises that follow it.

THE COLORBLIND CHEMIST

John Dalton (September 6, 1766 – July 27, 1844) was an English chemist, meteorologist and physicist. John Dalton's list of scientific accomplishments is long and impressive – he proposed the atomic theory of matter, discovered the Law of Multiple Proportions and the Law of Partial Gas Pressure, published one of the first atomic weight tables, and amassed more than 200,000 weather records in his study of meteorology. But Dalton (English, 1766-1844) also made history by becoming the first scientist to describe a common affliction he himself suffered from: colorblindness.

The son of a Quaker weaver, at the age of fifteen John Dalton joined his elder brother Jonathan in running a Quaker school in nearby Kendal. Dalton was appointed teacher of mathematics and natural philosophy at the “New College” in Manchester, a Dissenting academy. He remained in that position until 1800, when the college's worsening financial situation let him to resign his post and begin a new career in Manchester as a private tutor³ for mathematics and natural

philosophy. Dalton's early life was highly influenced by a prominent Eaglesfield Quaker named Elihu Robinson, a competent meteorologist and instrument maker, who got him interested in problems of mathematics and meteorology. In 1787 he began to keep a meteorological diary in which, during the succeeding 57 years, he entered more than 200,000 observations. Dalton's first publication was *Meteorological Observations and Essays* (1793), which contained the seeds of several of his later discoveries. A second work by Dalton, *Elements of English Grammar*, was published in 1801.

In 1794, shortly after his arrival in Manchester, Dalton was elected a member of the Manchester Literary and Philosophical Society, the *Lit & Phil*, and a few weeks later he communicated his first paper on *Extraordinary facts relating to the vision of colours*. **Colorblindness** (or Daltonism, as it is still known in England) is a hereditary condition that affects about 5 percent of all males and 0.5 percent of all females. Usually a colorblind individual can perceive some colors; in the most common form of the condition, the person cannot distinguish between red and green. In rare cases (about 0.0025 percent of the population), the person is totally colorblind and perceives color only as shades of black, white, and gray¹. Dalton was red-green colorblind. Color perception arises in certain cells called cones (because of their shape) that are located in retina. There are three kinds of cones: one for detecting red, one for green, and one for blue. When the green-detecting cones are missing, the perceived color is skewed toward the green. When the green-detecting ones are absent, the perceived color is skewed toward the red. The absence of blue-detecting cones is rare. The other cells used in seeing are called rods (again, because of their shape). Rods translate the power (or intensity) of light into monochromatic (single-color) values of black and white.

No cure exists for colorblindness, but the condition does not seem to handicap those who have it – most learn to compensate from an early age. In fact, people with colorblindness have succeeded in professions that would seem to require color perception. For example, some art historians believe that artist James Whistler, whose most famous work was the portrait of his mother, may have been colorblind; his paintings are filled with somber shades of brown, gray, and black. Similarly, many would argue that a chemist must be able to distinguish chemicals by color. But John Dalton proved that colorblindness need not hamper a chemist in the least.

Dalton's first paper was followed by many others on diverse topics on rain and dew the origin of springs, on heat, the colour of the sky, steam, the auxiliary verbs and participles of the English language and the reflection and refraction of light. In 1800 he became a secretary of the *Manchester Literary and Philosophical Society*, and in the following year he presented the first of an important series of papers, entitled *Experimental Essays* on the constitution of mixed gases; on the pressure of steam and other vapours at different temperatures, both in a vacuum and in air; on evaporation; and on the thermal

expansion of gases. In the two or three years he published several papers on the absorption of gases by water and other liquids (1803), containing his law of partial pressures now known as Dalton's law. The most important of all Dalton's investigations are those concerned with the atomic theory in chemistry.

Five main points of Dalton's Atomic Theory:

- Elements are made of tiny particles called atoms.
- All atoms of a given element are identical.
- The atoms of a given element are different from those of any other element.
- Atoms of one element can combine with atoms of other elements to form compounds. A given compound always has the same relative numbers of types of atoms.
- Atoms can not be created, divided into smaller particles, nor destroyed in the chemical process. A chemical reaction simply changes the way atoms are grouped together.

Before he had propounded the atomic theory, he had already attained a considerable scientific reputation. In 1804 he was chosen to give a course of lectures on natural philosophy at the Royal Institution in London, where he delivered another course in 1809-1810. However, some witnesses reported that he was deficient in the qualities that make an attractive lecture, being harsh and indistinct in voice, ineffective in the treatment of his subject, and singularly wanting in the language and power of illustrations.

In honour of Dalton's work, many chemists and biochemists use the (as of yet unofficial) unit *dalton* (abbreviated Da) to denote one atomic mass unit, or 1/12 the weight of a neutral atom of carbon-12.

The University of Manchester established two Dalton Chemical Scholarships, two Dalton Mathematical Scholarships and Dalton Prize for Natural History. In his book "The 100", Michael H. Hart ranks Dalton as the 32nd most influential person in history.

A lunar crater has been named after Dalton.

- Notes:**
1. private tutor – преподаватель, дающий частные уроки;
 2. gray = grey.

Exercise 1. Find in the text English equivalents for the Russian phrases:

перечень научных достижений; став первым ученым, который описал; страдать от; карьера частного учителя; начал вести дневник метеонаблюдений; которые заложили основу для некоторых, сделанных позже открытий; наследственное заболевание; может воспринимать некоторые цвета; не может различить красный и зеленый; при отсутствии колбочки сетчатки, определяющей красный цвет; другие клетки, участвующие в восприятии цвета, называются палочки сетчатки;

воспринимаемый цвет искажается; читать лекции по; завоевать значительную репутацию в научных кругах.

Exercise 2. *Translate the sentences from English into Russian.*

1. But Dalton (English, 1766-1844) also made history by becoming the first scientist to describe a common affliction he himself suffered from: colorblindness.
2. When the red-detecting cones are missing, the perceived color is skewed toward the green.
3. Rods translate the power (or intensity) of light into monochromatic (single-color) values of black and white.
4. No cure exists for colorblindness, but the condition does not seem to handicap those who have it – most learn to compensate from an early age.
5. In fact, people with colorblindness have succeeded in professions that would seem to require color perception.
6. For example, some art historians believe that artist James Whistler, may have been colorblind.
7. Similarly, many would argue that a chemist must be able to distinguish chemicals by color.
8. However, some witnesses reported that he was deficient in the qualities that make an attractive lecture, being harsh and indistinct in voice, ineffective in the treatment of his subject, and singularly wanting in the language and power of illustrations.

Exercise 3. *Answer the following questions:*

1. What was the list of Dalton's accomplishments?
2. In what way did he make history?
3. What is colorblindness?
4. Where does color perception arise?
5. What occurs with the perceived color when certain cones are missing?
6. Does colorblindness handicap those who suffer from it?
7. Do you remember the names of eminent people who suffered (suffer) from colorblindness?
8. What are the main points of Dalton's Atomic theory?
9. What was done by the society to honour Dalton's work?

THE NOBEL PRIZE

Read and memorize the vocabulary.

1.	aware [ə'weə] <i>n.</i>	- признание;
2.	to originate [ə'ri:dʒineɪt] <i>v.</i>	- давать начало;
3.	fulminate of mercury ['fʌlmineɪt] ['mæ: kjʊri]	- гремучая ртуть;
4.	explode [ɪks'pləʊd] <i>v.</i>	- взрывать(ся);
5.	upon impact	- при ударе;
6.	charge [tʃɑ:dʒ] <i>n.</i>	- заряд;
7.	patent ['pætənt] <i>v.</i>	- патентовать;
8.	enable [ɪ'neɪbl] <i>v.</i>	- давать возможность или право;
9.	blasting ['blɑ:stɪŋ] <i>a.</i>	- взрывчатый;
10.	feat [fi:t] <i>n.</i>	- подвиг;
11.	gunpowder ['gʌn,paʊdə] <i>n.</i>	- черный порох;
12.	boon [bu:n] <i>n.</i>	- благо, дар;
13.	further ['fə:ðə] <i>v.</i>	- продвигать, содействовать;
14.	fortune ['fɔ:tʃən] <i>n.</i>	- богатство, состояние;
15.	will [wɪl] <i>n.</i>	- воля.

Read the text and do exercises that follow it.

THE NOBEL PRIZE

Most scientists consider the Nobel Prize the most prestigious award a scientist can receive. But who was Alfred Nobel, and how did this namesake award originate?

Alfred Bernhard Nobel, chemist and engineer, was born in Stockholm, Sweden on October 21, 1833, and died in San Remo, Italy on December 10, 1896. Nobel made his fortune in explosives, as his father had. In 1863, Nobel developed a detonator based on the chemical compound mercury fulminate, which explodes upon impact. This detonator made it possible to use liquid nitroglycerin as a charge in explosives.

Even after an 1864 explosion leveled his factory and killed five people, including his younger brother, Nobel continued his experiments with nitroglycerin. He patented most famous invention, dynamite, in 1867. Dynamite was prepared from nitroglycerin absorbed in a porous material. It enabled the safe use of nitroglycerin and made Nobel both famous and wealthy. In 1875, Nobel invented an even more powerful explosive he called "blasting gelatin", and in 1887, he introduced ballistite, a nitroglycerin explosive that does not produce smoke. Nobel's innovations made many major civil engineering feats

possible, such as blasting through rock to create the Corinth Canal and the St. Gotthard Tunnel.

Prior to Nobel's work, black gunpowder was the primary explosive used in military warfare. Nobel hoped his inventions would decrease the demand for gunpowder and reduce the possibility of war. Ironically, while Nobel's work produce more powerful explosives that proved a boon to civil engineers, it also made military weaponry even more powerful and deadly. Still, Nobel's interest in furthering peace, along with his commitment to science and affinity for fine literature, led him to leave much of his fortune to a fund established in his will. The interest the fund generates is awarded annually to individuals who have made outstanding contributions in the fields of science, literature, and peace.

Exercise 1. Find in the text English equivalents for the Russian phrases:

1. ... наиболее престижное признание, которое может получить ученый
2. ... разработал детонатор
3. ... сделал возможным использование жидкого нитроглицерина в качестве заряда.
4. ... и сделало Нобеля как известным, так и состоятельным.
5. Нобель надеялся, что его изобретения уменьшат возможность возникновения войн.
6. Инновации Нобеля сделали возможным основные достижения в области гражданского строительства.
7. ... привели к тому, что большую часть своего состояния он оставлял фонду

Exercise 2. Agree, partially agree or disagree with the statements:

1. The Nobel Prize is the most prestigious award a scientist can receive.
2. The Nobel Prize is awarded every year to individuals for their outstanding contributions in the field of science.
3. Nobel made fortune on explosives.
4. He developed a detonator based on mercury.
5. He patented his most famous invention, dynamite, in 1876.
6. Though Nobel hopes his inventions would reduce the possibility of war, they made military weaponry even more powerful and deadly.

Exercise 3. Answer the following questions:

1. What was Alfred Nobel?
2. What was he interested in?
3. What was his most famous invention?
4. Was the role of Nobel's innovations in civil engineering great?
5. Why did Nobel leave much of his fortune to a fund established in his will?

Exercise 4. Name some scientists who were Nobel-prize winners in the 19th -20th centuries.

LAVOISIER: THE FATHER OF CHEMISTRY

Read and memorize the vocabulary.

1.	endeavour [in'dævə] <i>n.</i>	- попытка, стремление;
2.	tax-collector ['tækskə,lektə] <i>n.</i>	- сборщик государственного налога;
3.	income ['ɪnkʌm] <i>n.</i>	- доход;
4.	venture ['ventʃə] <i>n.</i>	- рискованное предприятие или начинание;
5.	enable [i'neɪbl] <i>v.</i>	- давать возможность или право;
6.	render ['rendə] <i>v.</i>	- представлять, изображать;
7.	originate [ə'ɪdʒɪneɪt] <i>v.</i>	- создавать;
8.	budding ['bʌdɪŋ] <i>a.</i>	- многообещающий;
9.	accomplishment [ə'kɒmplɪʃmənt] <i>n.</i>	- достижение;
10.	balance(s) ['bæləns] <i>n.</i>	- весы;
11.	bequeath [bi'kwɪ:ð] <i>v.</i>	- завещать, передавать потомству;
12.	legacy ['legəsi] <i>n.</i>	- наследие.

Read the text and do exercises that follow it.

LAVOISIER: THE FATHER OF CHEMISTRY

Born to a wealthy family in Paris, Antoine Laurent Lavoisier inherited a large fortune when his mother died when he was five. He attended the College Mazarin from 1754 to 1761, studying chemistry, botany, astronomy, and mathematics. From 1761 to 1763, he studied some law at the University of Paris where he received his Bachelor of law in 1763. At the same time, he continued attending lectures in the natural sciences. Lavoisier's devotion and passion for chemistry was largely influenced by Etienne Condillac, a prominent French scholar of the 18th century. His first chemical publication appeared in 1746.

Lavoisier entered an arranged marriage with Anne Pierrette Paulze in 1771, when Marie was fourteen years old. Lavoisier bride was the daughter of a wealthy tax collector, and Lavoisier invested much of his money into a private firm that collected taxes for the French government. He received an income of

over 100,000 francs per year from this venture, and this money supported his research. Marie worked alongside her husband in the laboratory and rendered most of the drawings that appeared in his papers. She created many sketches and carved engravings of the laboratory instruments which Lavoisier and his colleagues used. She also edited and published Lavoisier's memories and hosted many parties during which eminent scientists would discuss new chemical theories. Some of Lavoisier's most important experiments were in *thermodynamics*, and in *the nature of combustion*, or burning. Through these experiments, he demonstrated that burning is a process that involves the combination of a substance with oxygen. He also demonstrated the role of oxygen in metal rusting, as well as its role in animal and plant respiration. He showed that, although matter can change its state in a chemical reaction, the quantity of matter is the same at the end as at the beginning of every chemical change. He burned phosphorus and sulfur in air, and proved that the products weighed more than the original. Nevertheless, the weight gained was lost from the air. These experiments provided evidence for *the Law of the Conservation of Matter* or, in other words, *the Law of Conservation of Mass*.

Although Lavoisier was a brilliant scientist, his scientific life was not without controversy; on several occasions he claimed credit for another person's research. Nonetheless, Lavoisier's legitimate contributions to the budding field of chemistry are impressive: he originated the *Law of Conservation of Mass* as well as *the oxidation theory*, which holds that oxygen reactions cause combustion. He was also one of the first to use systematic names for compounds. But perhaps Lavoisier's most notable accomplishment was the development of accurate mass measurements, which enabled him to perform the research that undergirded all his other achievements. Unfortunately, the French Revolution leaders disliked anyone associated with the previous government, especially tax collectors; revolutionaries guillotined the scientist in 1794.

Lavoisier's importance to science was expressed by the mathematician Joseph Louis Lagrange: "It took them only an instant to cut off that head, but France may not produce another like it in century." One and half years following his death, Lavoisier was exonerated¹ by the French government. About a century after his death, a statue of Lavoisier was erected in Paris. It was later discovered that the sculptor had not actually copied Lavoisier's head for the statue, but used a spare head of the Marquis de Condorcet, the Secretary of the Academy of Scientists during Lavoisier's last years. Lack of money prevented alterations being made. The statue was melted down during the Second World War and had not been replaced as of the summer of 2007. However, one of the main "lycees" (high school) in Paris and a street in the 8th arrondissement² are named after Lavoisier, and a statue of him is found on the Hotel de Ville.

Notes:

1. was exonerated – был оправдан;
2. arrondissement – муниципальное подразделение.

Exercise 1. Find in the text English equivalents for the Russian phrases:

1. ... он первым проводил исследования, основанные на систематическом экспериментировании и точных измерениях.
2. ... работала бок о бок с мужем в лаборатории.
3. ... в его научной жизни не обошлось без противоречий.
4. ... неоспоримый вклад Лавуазье в перспективную область химии.
5. ... наиболее значимым достижением Лавуазье было
6. ... завещал своим последователям важное во всех отношениях наследие
... .

Exercise 2. Agree or disagree with the statements:

1. Antoine Laurent Lavoisier was the son of a French chemist.
2. Lavoisier invested much of his money into research on systemic experimentation and precise measurement.
3. Lavoisier's wife worked alongside with him in the laboratory making calculations and measurements.
4. Lavoisier is considered to be the originator of the Law of Conservation of Mass as well as an oxidation theory.

Exercise 3. Answer the following questions:

1. What was Lavoisier's research based on?
2. Who supported his research financially?
3. Who rendered most of the drawings in his papers?
4. Why was he guillotined by the revolutionaries during the French revolution?
5. Why Lavoisier is called the "Father of chemistry".

MARIE CURIE, A GENIUS IN ANY TIME

Read and memorize the vocabulary.

1.	pivotal [pɪvətl] <i>a.</i>	- центральный, основной;
2.	inauspiciously [,ɪno:s'pi:ʃəslɪ] <i>adv.</i>	- неблагоприятно;
3.	admission [əd'mɪʃən] <i>n.</i>	- принятие, прием (в учебное заведение);
4.	It was ... that	- именно;

5.	eminent ['emɪnənt] <i>a.</i>	- выдающийся, знаменитый;
6.	with the aid of <i>smb.</i>	- с помощью кого-либо;
7.	to team up with <i>smb.</i>	- объединиться с кем-либо;
8.	treatise ['tri:tɪz] <i>n.</i>	- трактат, научный труд;
9.	feat [fi:t] <i>n.</i>	- подвиг, проявление большой ловкости, искусства;
10.	pernicious anaemia [pə:'niʃəs]	- злокачественная анемия;
11.	exposure [ɪks'pəʊʒə] <i>n.</i>	- подвергание (риску, опасности);
12.	heritage ['herɪtɪdʒ] <i>n.</i>	- наследство, наследие;
13.	leukaemia [lju:'ki:mɪə] <i>n.</i>	- лейкемия;
14.	to bestow [bɪ'stəʊ] <i>v.</i>	- награждать (on, upon).

Read the text and do exercises that follow it.

MARIE CURIE, A GENIUS IN ANY TIME

Marie Curie, often called Madame Curie, was a woman of unequalled achievements in the history of chemistry and physics. Born in Warsaw, Poland on November 7, 1867, Curie was to become a pivotal figure in the scientific world by the early twentieth century.

Curie's scientific career began inauspiciously: she was refused admission to the University of Warsaw in 1891 because she was a woman. However, she entered the Sorbonne in France the same year and soon earned her master's and doctor's degrees in physics*. It was during this period that two significant people entered her life: Pierre Curie, one of her professors, who became her husband in 1895; and eminent physicist Antoine Henri Becquerel. Becquerel introduced the Curies to his discovery of the phosphorescence of uranium; this led to Marie's discovery of radium years later.

Toward the end of the 1890s, Curie's achievements began to accumulate with impressive speed. Along with her husband, Pierre, Marie discovered *polonium* on July 18, 1898; on December 26, 1898, she discovered *radium* with the aid of Gustave Belmont. Curie named element polonium after her homeland, Poland. Also during that eventful 1898, Marie and Pierre discovered that thorium emitted what they first called "uranium rays". Marie later renamed these rays *radioactivity*.

In 1899, Marie Curie teamed up with Fritz Geisel and Antoine Henri Becquerel to prove that β - rays, one form of radiation, were actually high-speed electrons. The 1903 Nobel Prize in physics was awarded to Marie and Curie for their study of radiation and to Antoine Henri Becquerel for work on spontaneous radioactivity.

Marie achieved another first in 1906 when she became the first woman professor at the Sorbonne in the entire 650 years of the school's existence. After Pierre died in a traffic accident, Marie was appointed to fill his position. Marie continued her radioactivity research. She published her landmark book, *Traité de radioactivité* (Treatise on radioactivity), in 1910. The following year, Curie won the Nobel Prize in chemistry for her discovery of the elements radium and polonium. Winning two Nobel Prizes is a feat rarely duplicated.

Curie died at the age of 67 from pernicious anemia, a condition probably induced by exposure to radiation. She left behind a rich heritage. Her daughter, Irène Joliot-Curie (French, 1897-1956), collaborated with her husband Frédéric Joliot-Curie to develop *artificial radioactive elements* – an effort that won them the 1935 Nobel Prize in chemistry. Irène died in 1956 from leukemia; her disease was also probably induced by working with radioactive materials.

The honors and awards Marie Curie earned are almost unmatched by any modern scientist. Along with her two Nobel Prizes, she received the Berthollet Medal (1903), the Davy Medal of the Royal Society of London (1903), the Benjamin Franklin Medal (1921), the Willard Gibbs Medal from the American Chemical Society (1921), and many other awards. Over a hundred institutions, scientific societies, cities (including Warsaw), and countries bestowed honorary titles on Curie. Although she once was determined not to marry, feeling that science was her first and only love, her marriage to Pierre actually furthered the work of both scientists and left an indelible mark on the study of radioactivity.

Note: - *earned her master's and doctor's degrees in physics – получила степени магистра и доктора физики.

Exercise 1. Find in the text English equivalents for the Russian phrases:

1. ... и именно в этот период времени
2. ... опубликовала знаковую книгу «Трактат по радиоактивности».
3. Научная карьера М. Кюри началась неблагоприятно для нее
4. ... становится основной фигурой научного мира в начале 20-го столетия.
5. ... получила степени магистра и доктора физики.
6. ... Кюри поразительно быстро достигла больших результатов.
7. ... умерла в возрасте 67 от злокачественной анемии.
8. ... болезнь, возможно, была вызвана работой с радиоактивными материалами.
9. ... наука была ее первой и единственной любовью.
10. ... наряду с двумя Нобелевскими премиями.

Exercise 2. Agree or disagree with the following statements:

1. Curie became the main figure in the scientific world by the early twentieth century.
2. She got her education at the University of Warsaw.
3. Curie discovered polonium along with outstanding physicist Antoine Henri Becquerel;
4. Marie and Pierre won two Nobel Prizes in physics and chemistry;
5. M. Curie died at the age of 64 from leukemia a condition probably induced by working with radioactive materials.
6. Science was M. Curie's the first and the only love.

Exercise 3. Answer the following questions:

1. Why Curie was refused admission to the University of Warsaw?
2. What education did she get?
3. Whose discovery of phosphorescence led to Marie's discovery of radium years later?
4. Why was the element polonium discovered by Marie called so?
5. What scientists did Marie team up with in her scientific studies?
6. What heritage did she leave behind?

**JOHANN AUGUST KRUSE (1822-1895)
GERMAN-TRAINED PIONEERING AUSTRALIAN PHARMACIST**

Read and memorize the vocabulary.

1.	apprenticeship [ə'prentɪʃɪp] <i>n.</i>	- срок учения (в старину 7 лет);
2.	failure ['feɪljə] <i>n.</i>	- неуспех, неудача;
3.	industry ['ɪndəstri] <i>n.</i>	- трудолюбие, прилежание, усердие;
4.	conduct a pharmacy	- руководить аптекой;
5.	commence <i>v.</i>	- начинать (-ся);
6.	lease a store	- сдавать или брать внаем, в аренду;
7.	aperient [ə'piəriənt] <i>n., a.</i>	- слабительное;
8.	win recognition	- завоевать призвание;
9.	manage <i>v.</i>	- руководить, управлять, заведовать;
10.	attend lectures	- посещать лекции;

11.	give the opportunity	- ДАВАТЬ ВОЗМОЖНОСТЬ;
12.	contribute significantly	- ВНЕСТИ ЗНАЧИТЕЛЬНЫЙ ВКЛАД.

Read the text and do exercises that follow it.

*JOHANN AUGUST KRUSE (1822-1895)
GERMAN-TRAINED PIONEERING AUSTRALIAN PHARMACIST*

The German-trained pharmacist Johann (later John) August Kruse (1822-1895) was a key figure in the development of pharmacy and pharmaceutical education in Victoria, Australia. He contributed significantly to the professional association, the Pharmaceutical Society of Victoria, the local pharmaceutical industry and the School of Pharmacy. Prepared for his profession in his homeland through an apprenticeship, studies at the University of Göttingen and passing the State Examination, Kruse seems to have aspired to own a provincial pharmacy in East Friesland. Failure to realize this ambition led him to a new life in Australia. Here his high quality German education distinguished him from many of his local colleagues, who were British-trained or untrained, and was of fundamental importance to his considerable achievements.

Johann was born on 7 July 1822 in Aurich, East Friesland. On 31 October 1846 Kruse was accepted to study pharmacy at the University of Göttingen, where he was punctilious in attending lectures and showed great industry. After completing his course the following year, he undertook his State Examination before the Royal Medical Board of Hannover being examined by Dr Hollscher, President of the Board, and two local pharmacists, Bossel and Hildebrand. Kruse achieved the first class and highest grade. Having qualified as a pharmacist Kruse worked for some years in East Friesland as administrator of pharmacies.

In 1852 he moved to London, where he managed the pharmacy of Dr S. Weil in Oxford Street. Soon after his arrival Kruse opened a pharmacy in the suburb of Richmond. Together with conducting his pharmacy Kruse commenced the production of mineral waters and various chemicals, including substances derived from local natural products. In 1863 Kruse leased a store in Melbourne and equipped it as a chemical laboratory and manufactory for the production of his mineral waters, an insecticide, *Kruse's Fluid Magnesia* – a highly successful antacid and mild aperient still on the market – and other chemicals.

He won recognition at the 1861 Victoria Exhibition and the Intercolonial Exhibition held in Melbourne in 1867 with awards for his fluid magnesia, mineral waters and chemicals. In March 1857 the Pharmaceutical Society of Victoria was formed and Kruse was one of twelve founding members of its Council. He spoke of the need for pharmaceutical reform in the colony because 'deficiency exists in the education of chemists and, druggists, as well as in the manner in which pharmaceutical matters are carried'. He advocated the adoption

of the European system in Victoria and thus ‘the total separation of medicine and pharmacy’.

While Kruse had first promoted a school of pharmacy in 1860, it was only when he was in his mid-fifties that¹ he was given the opportunity to contribute significantly to pharmaceutical education and found the School of Pharmacy. He taught *materia medica*² and botany there while maintaining his own School in Fitzroy. He continued to conduct his own educational enterprise, the Fitzroy School of Chemistry and Pharmacy until 1890. He also ‘devoted himself to analytical chemistry’ and accepted appointments as a public analyst.

In early 1895 Kruse was diagnosed with laryngeal cancer³ from which he died on 19 October.

The study of chemistry and pharmacy enabled Kruse to gain new insights into nature and led him to applications of his knowledge. Throughout his life Kruse promoted education, particularly pharmaceutical education. Kruse’s contributions to pharmacy and applied science live on in the Victorian College of Pharmacy, now part of Monash University, the Pharmaceutical Society of Australia.

- Notes:**
1. It was ... that - именно;
 2. *materia medica* - (лат.) медицинские науки;
 3. laryngeal cancer - рак гортани.

Exercise 1. Give English equivalents to the Russian phrases:

1. ... получив право заниматься фармацевтической деятельностью.
2. ... работал ... в качестве управляющего аптеками.
3. ... начал производство минеральных вод и различных химических веществ.
4. Он завоевал признание
5. ... один из 12 учредителей Совета (фармацевтического общества Виктории).
6. Он выступал за введение (принятие) Европейской системы, т.е. полное разделение медицины и фармации.
7. Он внес значительный вклад в фармацевтическое образование и основал школу фармации.
8. ... посвятил себя решению проблем аналитической химии.
9. ... ему был поставлен диагноз рака гортани.

Exercise 2. Translate these sentences from English into Russian:

1. After completing his course the following year, he undertook his State Examination before the Royal Medical Board of Hannover being examined by Dr Hollscher, President of the Board, and two local pharmacists, Bossel and Hildebrand.

2. Together with conducting his pharmacy Kruse commenced the production of mineral waters and various chemicals, including substance derived from local natural products.
3. He won recognition at the 1861 Victoria Exhibition and the Intercolonial Exhibition held in Melbourne in 1867 with awards for his fluid magnesia, mineral waters and chemicals.
4. He spoke of the need for pharmaceutical reform in the colony because 'deficiency exists in the education of chemists and druggists, as well as in the manner in which pharmaceutical matters are carried'.
5. While Kruse had first promoted a school of pharmacy in 1860, it was only when he was in his mid-fifties that he was given the opportunity to contribute significantly to pharmaceutical education and found the School of Pharmacy.

Exercise 3. *Agree, partly agree or disagree with the following statements. Correct the false statements.*

1. Johann August Kruse studied pharmacy at the University of Göttingen.
2. After completing his course at the university he worked as a pharmacist.
3. In London Kruse organized a chemical laboratory for the production of mineral waters, Kruse's Fluid Magnesia – a highly successful antacid and mild aperient – and other chemicals.
4. Kruse was against pharmaceutical reform in Australia.
5. J.A. Kruse contributed significantly to the professional association, the Pharmaceutical Society of Victoria, the local pharmaceutical industry and the school of pharmacy.

Exercise 4. *Answer the following questions:*

1. Why is Johann August Kruse considered to be a key figure in the development of pharmacy and pharmaceutical education in Victoria, Australia?
2. Where did J.A. Kruse get his education?
3. Did he show great industry during his studies at the University?
4. What was he engaged in after his graduation from the University of Göttingen?
5. What chemicals did he develop in his chemical laboratory and produce in his manufactory?
6. What was his contribution to the pharmaceutical Society of Victoria?
7. How did J.A. Kruse promote pharmaceutical education in Australia?

THE BRAINS BEHIND THE 21ST CENTURY

Read and memorize the words.

1.	household names	- имена, которые знают все;
2.	breakthrough <i>n.</i>	- прорыв, скачек;
3.	a stunned world	- ошеломленный мир;
4.	shape <i>v.</i>	- определять, формировать, придавать форму;
5.	inferior <i>a.</i>	- низший, подчиненный;
6.	tackle <i>v.</i>	- браться за, взяться за;
7.	trigger <i>v.</i>	- вызывать, влечь;
8.	boost <i>v.</i>	- увеличивать, стимулировать;
9.	a crucial step	- решающий шаг;
10.	strand <i>n.</i>	- нить, прядь;
11.	significant <i>a.</i>	- значительный, важный;
12.	stem cell	- стволовая клетка;
13.	raise prospects	- увеличить перспективы;
14.	distorting effects	- искаженные эффекты;
15.	mimic <i>v.</i>	- подражать, передразнивать, пародировать.

Read the text and do exercises that follow it.

THE BRAINS BEHIND THE 21ST CENTURY

Inventions have the power to change the world, but only a few scientists can become household names. Breakthroughs can often come from unexpected quarters, as Dolly the cloned sheep proved to a stunned world in 1997. Working in laboratories and academic institutions, there are little-known scientists and engineers who could revolutionize the way we live in the 21st century. Helped by leading figures in the scientific community, The Sunday Times has identified those who could shape the 21st century. Some are tipped as future Nobel prize-winners, others have yet to reach their full potential, but all are working to expand the frontiers of human knowledge.

Andrei Mirzabekov is the Russian inventor of the first biochip, a hand-held device that can detect if a person carries particular genes. This invention is set to revolutionize the diagnosis of genetic diseases but will also raise fears of the creation of an underclass, whose DNA can be labeled as “inferior”. *Mirzabekov* leads the effort to develop credit-card-sized biochip that can test a person’s DNA in a matter of hours.

Glenn Gibson, a pioneer in the science, will fill future supermarkets with “functional food”, such as bread that prevents food from poisoning, crisps that protect against cancer and biscuits that are as nutritious as vegetables. Gibson’s work at the Institute of Food Research is revealing how benevolent bacteria in the human gut – some of which can tackle an array of serious illnesses – can be activated by what we eat.

Head of the world-beating Robotics Institute at Carnegie Mellon University in America, *Takeo Kanade* specializes in developing machines that can function without human control, such as autonomous cars and helicopters. He is currently working with surgeons to develop “smart tools” capable of performing operations better than a human physician.

David Lane is the discoverer of the P53 gene, which stops tumors from forming by triggering natural defenses. Lane is head of molecular oncology at Dundee University and his drug development company was inspired by the death of his father from colon cancer. He hopes that his work will lead to the creation of drugs that combat cancer by boosting the body’s own defenses.

Mark Humayun is eye surgeon and biomedical engineer who has restored limited sight to the blind by linking a microchip to the human retina, thus transforming electronic images into electrical impulses that are transmitted via the optic nerve to the brain. Now, at John Hopkins University, he is working on the creation of a permanent implant. He believes that within 10 years there will be a chip allowing a person with retinal blindness to walk around in a room independently.

A pioneer in revealing the biochemistry of life, *Hugh Pelham* has drawn up the first complete outline of how living organisms function at the levels of proteins. It’s a crucial step towards understanding many longstanding puzzles, from diseases to the ageing process. He is now working to flesh out the details at the Laboratory of Molecular Biology in Cambridge.

Leading nanotechnologist at the University of California, *Paul Allvisatos* is combining electronics with molecular biology to build the first simple part-biological machines. His creation, a combination of strands of DNA and tiny pieces of crystal, is seen as a significant step in opening up a field that may ultimately produce a wide range of machines from bio-electronic computers to microscopic medical devices that can tackle problems inside living cells.

James Thomson, biologist found the key to future transplant technology by isolating embryonic stem cells and keeping a culture of them alive in a laboratory for a year. Thomson’s work, if combined with cloning techniques, raises the prospect of organ banks. Because embryonic stem cells are capable of developing into any specialized cells that make up the human body, a person could have a lifetime supply of spare parts to draw on in case of emergency –for example pancreatic cells for treating diabetes or neurons for Parkinson’s disease.

Lawrence DeLucas is a leading expert in viruses and bacteria whose work will help provide new treatment for diseases from Aids to influenza. DeLucas, a

former astronaut will lead a project to grow giant crystals of the proteins vital to dangerous viruses and bacteria away from the distorting effects of Earth's gravity. These crystals should give unpredictable clues as to how each virus and bacterium is built and how it can be combated with drugs to attack their weak spots.

Malcolm Young has led the way in using powerful computer techniques to give an overall picture of how the human brain works. The work of Young, head of psychology at Newcastle University, will lead to new ways of treating mental and head injuries, as well as enabling computer scientists to invent electronic brains that mimic the behavior of living ones.

Exercise 1. Find in the text the English equivalents to the Russian words:

расширить границы человеческих знаний; прибор, помещающийся в руке; породить страхи; направлять усилия; взяться за; усилить собственную защиту организма; долголетние головоломки; повысить перспективу банка органов; дать беспрецедентную разгадку; атаковать слабые стороны; всесторонняя картина; подражать поведению.

Exercise 2. Define, who of the scientists is described in the following sentences:

- a. Andrei Mirzabekov
- b. Glenn Gibson
- c. Takeo Kanade
- d. David Lane
- e. Mark Humayun
- f. Hugh Pelham
- g. Paul Allvisatos
- h. James Thomson
- i. Lawrence DeLucas
- j. Malcolm Young

1. His drug development company was inspired by the death of his father. ...
2. He drew up the first complete outline of how living organisms function on the level of proteins. ...
3. He restored limited sight by linking a microchip to the human retina. ...
4. He is working at combining electronics with molecular biology. ...
5. His invention helps to detect and diagnose genetic diseases. ...
6. He is studying viruses and bacteria to provide new treatment for diseases from Aids to influenza. ...
7. He has invented the biochip which helps to detect particular human genes of a person. ...
8. He uses computer techniques to give a complete explanation of how the human brain functions. ...
9. He works at the prospect of organ banks. ...

10. He will provide people with food which will rather nutritious and will prevent causes of some serious diseases. ...

Exercise 3. *Answer the following questions:*

1. Can little-known scientists revolutionize the world in which we live nowadays?
2. Where was the information about these scientists taken from?
3. What has Andrei Mirzabekov invented? Where and what for can his invention be used?
4. What does “functional food” mean? Who is working at this project?
5. Why is the development of machines functioning without human control considered to be so important?
6. What is the P53 gene and who is its discoverer?
7. How has Mark Humayun managed to restore limited sight? What will happen in 10 years, according to him?
8. Why is the complete outline of how organisms function at the levels of proteins so important?
9. What for has Paul Allvisatos combined electronics with molecular biology? Where can his invention are used?
10. What has been discovered by James Thomson in the field of transplant technology?
11. What problem is the research of Lawrence DeLucas devoted to?
12. What for is Malcolm Young using powerful computer techniques? Where can the data of his research be used?

Exercise 4. *Rank the scientists and their discoveries starting from the least significant one and finishing with the most important. Explain why you consider exactly this discovery to be so significant, give your grounds.*

UNIT IV. ALTERNATIVE MEDICINE

HOMEOPATHY

Read and memorize the words.

1.	minute [maɪ 'nju:t] <i>a.</i>	- мелкий, мельчайший;
2.	precept ['pri:sept] <i>n.</i>	- правило, заповедь;
3.	medicine chest	- домашняя аптечка;
4.	rampant ['ræmpənt] <i>a.</i>	- сильно распространенный, свирепствующий (о болезнях);
5.	give up <i>v.</i>	- оставить, отказаться (от работы и т.п.);
6.	treatise ['tri:tiz] <i>n.</i>	- трактат, научный труд;
7.	quinine [kwɪ' ni:n] <i>n.</i>	- хинин;
8.	puzzle ['plz] <i>v.</i>	- ставить в тупик, озадачивать;
9.	astringent [əs' trɪndʒənt] <i>a., n.</i>	- вяжущий, вяжущее средство;
10.	arsenic ['a:snɪk] <i>n.</i>	- мышьяк;
11.	avoid [ə' void] <i>v.</i>	- избегать;
12.	enhance [ɪn' hæ:ns] <i>v.</i>	- усиливать;
13.	strain [streɪn] <i>v.</i>	- процеживать, фильтровать.

Read the text and do the tasks that follow it.

HOMEOPATHY

Homeopathy is a *holistic** form of medicine that aims to help the body heal itself. It works for both acute (short-term) illnesses and chronic (long-term) ailments, and the prevention of illness is as crucial to its philosophy as the treatment. The name homeopathy comes from the Greek word *homios* meaning “like” and *pathos* meaning “suffering”. The word “homeopathy” simply means treating like with like. This means that a substance that causes symptoms of illness in a well person can also be used to cure similar symptoms when they result from illness.

The minute substances used in treatment are called homeopathic remedies. There over 3,000 homeopathic remedies, which are usually referred to by their abbreviated name, for example Arsenicum album becomes *Ars.alb.* and *Mercurius solubilis* becomes *Merc.sol.*

- * *holistic approach* – a belief that the body acts in unison with the psyche (spirit) and emotions to maintain the equilibrium necessary for overall health and well-being.

BACKGROUND AND HISTORY

Hippocrates understood the basic precepts of homeopathy, and he had a selection of remedies in his personal medicine chest. But homeopathy as we know it was founded by a German doctor and chemist named **Samuel Hahnemann** (1755-1843). Disillusioned by the medical practices of his day, and by the rampant spread of disease, he gave up conventional medicine in order to work as a translator.

It was this work that led to his discovery of homeopathy. While translating Dr. William Cullen's *A Treatise on Materia Medica* he noted that quinine was listed as an effective treatment for malaria because of its astringent properties. Hahnemann was puzzled, for although he knew that quinine was antimalarial, he also knew that its astringency had little to do with it. For several days he took low doses of quinine and noted his reactions to it. One by one, he developed the symptoms of malaria even though he did not have the disease. Each time he took another dose of quinine, the symptoms recurred, and when he didn't take it, they went away. He believed it was quinine's ability to cause the symptoms of malaria that made it such an effective treatment for the disease. From here he experimented with other popular medicines, including arsenic and mercury. From this system of testing he built up a drug picture for each of the hundreds of substances that he tested.

Next, he attempted to build up a "symptoms picture" of each client before he prescribed a remedy for them. He discovered that the more information he had about a client, the more accurately he could prescribe a remedy that would work.

Making the medicines

Hahnemann tested numerous medicinal substances on himself and his followers who, although healthy, took them until they produced symptoms similar to the illnesses for which they were prescribed. These experiments were known as proving, and homeopathic medicines are tested on healthy people to this day.

Hahnemann noticed that patients treated by this method often got worse before getting well. To avoid this problem, he began to reduce the size of the dose and he observed that progressive dilution, with vigorous shaking at each stage, enhanced the effectiveness instead of diminishing it. This process is known as potentiation**.

Extracts of the natural ingredient are dissolved in a mix of alcohol and water and left to stand for two to four weeks. During this time they are shaken occasionally and then strained. The strained solution is known as the mother tincture. The mother tincture is then diluted to make the different potencies. The various dilutions are then added to tiny lactose tablets, granules, or powder and stored in dark bottles. The higher the dilution number, the more heavily it has been diluted. It is the higher dilutions that prove the strongest.

Medicines produced in this way are safe, nontoxic, and relatively inexpensive, and can be used for young and old, as well as pets and farm animals.

** *potentijation* – усиление действия (лекарства).

Exercise 1. Find in the text English equivalents corresponding to the Russian ones.

1. ... профилактика болезни также важна для понимания ее сути, как и самолечение.
2. ... просто означает лечение подобного подобным.
3. ... гомеопатические средства.
4. ... сокращенное название.
5. ... и в своей аптечке он имел набор лекарственных средств.
6. Разочарованный существующей в его дни медицинской практикой
7. ... он перестал заниматься традиционной медициной.
8. ... но он также знал, что вяжущее свойство хинина ничего не имело общего с его анти-малярийными свойствами.
9. Он полагал, что именно способность хинина вызывать симптомы малярии
10. ... чем больше информации он получает о клиенте, тем точнее он может определить средство, которое будет эффективным.
11. ... заметил, что часто пациентам, использующим этот метод, становится хуже перед улучшением их состояния.
12. Чтобы избежать данной проблемы
13. Чем выше индекс растворения, тем сильнее раствор.

Exercise 2. Define the following statements as True or False:

1. Homeopathy works only for chronic ailments.
2. The minute substances which are used for treatment are called homeopathic remedies.
3. Samuel Hahnemann was the first who understood the basic precepts of homeopathy.

4. S. Hahnemann experimented with some medicines such as guanine, arsenic, mercury and the like, the total number of which being several hundred.
5. S. Hahnemann managed to build up both a drug picture of each tested substance and a “symptoms picture” of each client.
6. S. Hahnemann began to reduce the size of the dose to avoid the problem of getting worse before improvement of a person’s condition.
7. The mother tincture is a diluted solution.
8. Homeopathic remedies are safe, nontoxic but very expensive.

Exercise 3. Answer the following questions:

1. What is homeopathy?
2. What is the origin of the word “homeopathy”?
3. Who was the first to understand the basic precepts of homeopathy?
4. Who founded homeopathy as we know it at present?
5. What popular medicines did S. Hahnemann experiment with?
6. Did Hahnemann test medicinal substances on himself or on his followers?
7. What system of testing did he use?
8. Did Hahnemann come to a certain conclusion after his experiments?

Exercise 4. Enumerate the main steps of preparing homeopathic remedies.

HOW HOMEOPATHY WORKS

Read and memorize the words.

1.	acquire [ə'kwaiə] v.	- приобретать, достигать;
2.	physique [fi'zi:k] n.	- физические данные;
3.	to face responsibilities	- относиться к обязанностям (обязательствам);
4.	pin-point ['pɪnpɔɪnt] v.	- указать точно, заострить внимание;
5.	follow-up ['fɒləʊ'ʌp] a.	- последующий;
6.	flavoring ['fleɪvəɪŋ] n.	- ароматизатор;
7.	avoid [ə'vɔɪd] v.	- избегать, уклоняться;
8.	efficacy ['efɪkəsi] n.	- эффективность, действенность;
9.	ulcer ['ʌlsə] n.	- язва;
10.	cold sore [kəʊld] [so:]	- простой герпес;

11.	bursitis <i>n.</i>	- бурсит (воспаление синовиальной сумки);
12.	inherit [ɪnˈherɪt] <i>v.</i>	- наследовать, унаследовать;
13.	long-term [ˈlɒŋtɜːm] <i>a.</i>	- долгосрочный, длительный.

Translate the following word combinations:

the curative properties of a remedy, to eliminate side-effects, to treat a person as an individual, a set of rules, inherited and acquired characteristics, to be matched to a particular remedy, to be grouped under one of the constitutional types, in order to build up a complete picture of patient's health, to pinpoint the most suitable remedy, to have a follow-up visit to a doctor, mint flavorings, to attain and maintain good health.

Scan the text and do the tasks that follow it.

HOW HOMEOPATHY WORKS

Homeopaths prescribe remedies for the “whole” person, and the practice of homeopathy is still based on the three principles established by Dr. Hahnemann. This is the “law of similars,” the principle of the minimum dose and prescribing for the individual.

The law of similars states that a substance that can produce symptoms of illness in a well person can, in minute doses, cure similar symptoms of disease. The minimum dose states that by diluting a substance, its curative properties are enhanced and any side effects are eliminated.

Whole-person prescribing is probably the most important part of homeopathy, for the fundamental philosophy behind the practice is that each person is an individual and must be treated as such. A homeopath studies a person's temperament, personality, emotion and physical responses, even the food they like and dislike before prescribing.

Homeopaths believe that treatment works according to a set of rules known as the “*Laws of Cure*”, and these state that:

- ❖ a remedy begins to work from the top of the body downward
- ❖ it works from the inside out and from major to minor organs
- ❖ symptoms clear in reverse order of their appearance.

Homeopaths also believe that a person's constitution is made up of inherited and acquired physical, mental, and emotional characteristics and that these can be matched to a particular remedy that will improve their health, no matter what their illness.

Furthermore, people with similar characteristics and constitutions can be grouped under one of the constitutional remedy types, if they all share specific physical and emotional characteristics. Your constitutional type can change as your physique, health, and attitudes change, and some people can be a combination of constitutional types.

It is not clear exactly how homeopathy works, but studies have proved that it does. Hahnemann believed that remedies worked to balance the body so it was able to heal itself.

The consultation

The first consultation will take upward of an hour. Your homeopath will ask you numerous questions about yourself in order to build up a complete picture of you and your mental, physical, and emotional health. You will be asked about your family health, past illnesses, lifestyle, and diet, and then more specific and unusual questions such as how you react to cold, or what sorts of food you like, and how sleep, feel about darkness, and face responsibility. It is these last, seemingly trivial details, that help your homeopath to pinpoint the remedy most suitable for you.

Remedies are usually prescribed one at a time and may change as your symptoms clear. The remedy will come in the form of small pills, tablets, granules, powder, or liquid, which should be taken a half-hour before or after eating and drinking.

Diet and lifestyle changes may be suggested, and you can expect to have a follow up visit in order to check how the remedies are working. Treatment may only take one or two visits, but long-term conditions may take much longer. You should see some change in your condition within a few days.

What can homeopathy treat?

Homeopathy can treat almost any complaint – physical and psychological – although its efficacy appears to be dependent on the individual. Everything from indigestion, catarrh, childhood illnesses, gallstones, depression, burns, sports injuries, allergies, and stress to travel sickness, peptic ulcers, kidney disorders, hyperactivity, cold sores, and bursitis will respond, depending on the other steps that are taken by the sufferer to attain and maintain good health.

Exercise 1. Explain in English the meaning of the following expressions:

1. The “law of similarity”;
2. “Laws of cure”;
3. “Whole-person prescribing” as the most important part of homeopathy;
4. “A constitutional remedy type”.

Exercise 2. In order to prescribe the most suitable remedy, a homeopath must ask a patient many questions. Make up a list of such questions about patient's:

1. social status; 2. marital status; 3. family health; 4. past illnesses; 5. present illness (symptoms, length of time he/she has been suffering, the received medical care); 6. lifestyle (diet, preferences in food, sleeping habits); 7. personal qualities; 8. emotional state; 9. phobias; 10. occupational or environmental hazards.

Exercise 3. Pick out passages describing:

- a) the usual form of homeopathic remedies;
- b) cautions and contraindications in using homeopathic remedies;
- c) counteractions of homeopathic remedies with some substances;
- d) diseases which homeopathic remedies can treat.

Sum up the information about the items listed.

WHEN TO USE HOMEOPATHY

Read and memorize the words.

1.	first aid	- первая помощь;
2.	kit	- комплект или набор;
3.	potent ['pəʊtənt] a.	- сильнодействующее (лекарство);
4.	ailment ['eɪlmənt] n.	- недомогание;
5.	dilute [daɪ 'lju:t] v.	- разбавлять, разводить;
6.	encourage [ɪn'kʌrɪdʒ] v.	- поощрять, поддерживать;
7.	trial ['traɪəl] n.	- испытание, проба, эксперимент;
8.	hay fever	- сенная лихорадка;
9.	obstacle ['ɒbstəkl] n.	- препятствие, помеха;
10.	seek [si:k] v.	- искать, стремиться.

Read the text and do the tasks that follow it.

WHEN TO USE HOMEOPATHY

Home use

Homeopathy is safe for everyone, from babies to pregnant woman, and the elderly, and can address almost any condition, but it does not always work for everyone who tries it.

Homeopathy can be safely used in the home for simple, self-limiting ailments, and first aid. The medicines are not expensive and since they all have a wide range of applications, a home kit can be gradually built up. If this is stored correctly it can be kept almost indefinitely. You may have to look for a specialist homeopathic pharmacy if you want to buy some of the more unusual remedies or potencies.

The names of all homeopathic medicines are followed by a number that indicates its potency or “strength”. As a general rule, low potencies like 3 or 6 are used for long-standing or chronic conditions. Higher potencies like 30 or 200 are used for acute conditions such as colds or influenza, or following an accident. Higher potencies are also used constitutionally. When the correct remedy is chosen, symptoms should begin to clear immediately. Symptoms may become worse before they get better. In acute conditions, doses should be taken every half-hour to begin with, up to a maximum of about ten doses. As soon as there is some improvement, the interval between doses should be increased to 8 or 12 hours for two to three days at the most. In chronic conditions, 6c remedies are usually taken three times a day for up to 24 days, and 30c remedies every 12 hours for a few days. Because the medicine acts by stimulating the body’s ability to heal, once that healing is well-established there is no need to continue the treatment.

If a chosen remedy does not have a noticeable effect within a short period of time, then stop taking it. Long-term use or high doses of an incorrect remedy can cause the symptoms of the condition that the remedy is designed to treat to manifest themselves.

Homeopathic antidotes

Homeopathic remedies may safely be taken alongside conventional treatment although some drug may affect their action. A number of substances have the ability to counteract the homeopathic remedies, and these include coffee, alcohol, tobacco, minty flavorings, highly perfumed cosmetics, strongly smelling household cleaners, and aromatherapy oils. Avoid these when taking homeopathic remedies.

Research

French researcher Professor Jacques Benveniste claimed that diluting in water and succussing (vigorously shaking) a homeopathically prepared ingredient releases its energy into the water and the water “remembers” or retains an imprint of that energy. This confirms Hahnemann’s belief that it is the energy or “vibrational pattern” of the remedy, rather than its chemical content, that stimulates healing, by encouraging the body’s own healing force.

Recently, another homeopath, Dr. David Reilly, has published the results of a number of trials in leading medical journals that show that homeopathically

prepared allergens are effective in the treatment of asthma, hay fever, and perennial rhinitis. Other trials are taking place all over the world, but shortage of money is an obstacle to more work being done.

Undoubtedly, the growth in homeopathy is consumer-led as patients, aware of the side effects of many modern drugs, seek a gentler return to health. The low cost and safety of homeopathic medicines is leading governments to consider using them in order to reduce their huge drug bills. Medical students in Britain are asking for homeopathy to be included in their training, and yet in the United States it is banned in some states. Homeopathy has always been widely used in France and Germany, and there is growing interest in other European countries.

Exercise 1. Find in the text English equivalents for the following phrases:

1. первая помощь;
2. иметь широкую сферу применения;
3. специальная гомеопатическая аптека;
4. острые состояния;
5. как только наступает некоторое улучшение;
6. и вода «запоминает» или сохраняет отпечаток той энергии;
7. заметное воздействие;
8. вероятнее всего, именно энергия лекарственного средства, а не химический состав стимулирует излечение;
9. гомеопатически приготовленные аллергены;
10. длительное использование или высокие дозы неправильно подобранного лекарственного средства;
11. осведомленные о побочных действиях многих современных лекарств.

Exercise 2. Translate the following sentences into Russian:

1. Because the medicine acts by stimulating the body's ability to heal, once that healing is well-established there is no need to continue the treatment.
2. Long-term use or high doses of an incorrect remedy can cause the symptoms of the condition that the remedy is designed to treat to manifest themselves.
3. This confirms Hahnemann's belief that it is the energy or "vibrational pattern" of the remedy, rather than its chemical content, that stimulates healing, by encouraging the body's own healing force.
4. The low cost and safety of homeopathic medicines is leading government to consider using them in order to reduce their huge drug bills.
5. Medical students in Britain are asking for homeopathy to be included in their training, and yet in the United States it is banned in some states.

Exercise 3. Find the answers to the following questions in the text:

1. For what conditions can homeopathy be safely used in home?
2. What pharmacies are homeopathic remedies usually sold in?
3. What does a number which follows the name of a remedy indicate?
4. What conditions are higher (lower) potencies used for?
5. How should a homeopathic remedy be used in acute (chronic) conditions?
6. Whose studies confirm Hahnemann's belief that the energy of a remedy stimulates healing?
7. What were the results of a number of trials conducted by homeopath Dr. David Reily?
8. Why is there growing interest in using and studying homeopathy in many European countries?

Exercise 4. Express your opinion on the following:

1. Can homeopathic remedies entirely substitute modern drugs?
2. What are the main pros and cons in using homeopathy?
3. Is it worth carrying further investigations in the field of homeopathy?

HERBAL MEDICINE IN CHINA AND JAPAN

Read and memorize the following words.

1.	encourage [in'kʌrɪdʒ] v.	- поощрять, поддерживать;
2.	incorporate [in'kɔ:pəreɪt] v.	- включать;
3.	insurance [in'ʃʊərəns] n.	- страхование;
4.	realm [ri:lm] n.	- область, сфера;
5.	rite [raɪt] n.	- обряд, церемония;
6.	to stem (from) [stem] v.	- происходить;
7.	to be familiar with	- знать что-либо, быть в курсе чего-либо;
8.	assessment [ə'sesmənt] n.	- оценка;
9.	appraise [ə'preɪz] v.	- оценивать, расценивать;
10.	premise ['premɪs] n.	- предпосылка;
11.	comprehensive [,kɒmpri'hensɪv]	- всесторонний;
12.	pungent ['pʌndʒənt] a.	- острый, пикантный;
13.	astringent [əs'trɪndʒənt] a.	- вяжущий;
14.	affinity [ə'fɪnɪtɪ] n.	- свойство; хим. средство;
15.	pill [pɪl] n.	- пилюля;
16.	to prevent [pri'vent] v.	- предотвращать, предохранять;
17.	to be capable of	- быть способным.

Read the text and do the tasks that follow it.

HERBAL MEDICINE IN CHINA AND JAPAN

In China, natural substances have been used medicinally for thousands of years, and their application is encouraged by the present Chinese government. Traditional Chinese Medicine, including herbalism, began to be imported into Japan from about the 5th century A.D., and – with a few modifications – it has to a large extent been incorporated into the system operated by Japanese health insurance authorities.

The use of herbs once belonged partly to the realm of magic, in the healing rites performed by shamans (men and women of “natural wisdom”) and also stems from observations of the way in which animals treat themselves to various plants when sick or wounded. But careful study of herbs and their properties over thousands of years has developed Oriental herbal medicine into a highly refined and complex discipline.

Medical diagnosis is usually undertaken by practitioners familiar with both Western and Oriental medicine, resulting in a wide-ranging and comprehensive assessment of a patient’s symptoms. The *yin/yang** balance will be appraised, as well as the functioning of the internal organs and systems, the patient’s psychological state, diet, and lifestyle. And each of these factors will be considered in relation to the nature of the diseases or disorder involved, and its degree and speed of progression.

Following diagnosis, the therapist selects a combination of natural “herbs,” which may include mineral and animal ingredients. Western herbal therapies are often based on using a single herbal remedy at a time; indeed, most rural forms of folk medicine work on this premise. An Oriental herbal therapist will provide an *individually tailored*** cocktail of herbs that will work in conjunction with one another, and that will probably be readapted several times during the course of treatment as healing proceeds.

Herbs are classified in a number of ways. The nature of each is said to be cold, cool, hot, warm, or neutral. This is the chi or energy value of the herb and is used to balance excess or deficiencies in the “disharmony” that constitutes the illness. The herb’s taste and smell are also evaluated, as sour, bitter, sweet, pungent, or salty (and also tasteless or astringent). These characteristics are linked to special affinities with different organs or body systems and the related emotions that can be involved in disease. The herbs are also characterized as having an ascending or descending effect. The herbalist prescribes a mixture of herbs and tells the patient how to prepare and use them. Occasionally ready-prepared remedies such as herbal pills or tinctures may be given.

In Chinese medicine, diet is a matter of great importance in preventing and treating disease, and the Oriental therapist also gives instructions on how to correct the diet and lifestyle. Acupuncture may also be recommended.

Western research now suggests that many of the substances that are used in Oriental medicine may in fact be capable of forming part of the treatment of cancers and other diseases.

Notes:

* yin/yang – инь-ян; Yin and yang are opposite aspects of the material world. Like night and day that are interdependent, and the existence of one end of the spectrum presupposes the existence of the other aspect; i.e. Yin is necessary for Yang to exist, and vice versa. The idea of Yin and Yang describes the fundamental fluctuating balance of nature.

** individually tailored – индивидуально подобранные.

Exercise 1. Translate the following words and word combinations:

to be encouraged by; to a large extent, health insurance authorities; the realm of magic, the healing rites; to be familiar with; wide-ranging and comprehensive assessment of patient's symptoms; to be appraised; to consider each of the factors in relation to the nature of the diseases involved; to use a single herbal remedy at a time; to readapt individually tailored cocktail of herbs; energy value of the herb; herbs may have ascending or descending effect; ready-prepared remedies; a matter of great importance in preventing and treating disease.

Exercise 2. State the following statements as True or False:

1. The present Chinese government doesn't encourage the use of traditional Chinese medicine.
2. Oriental herbal medicine has been developed due to careful study of herbs and their properties.
3. Practitioners in China make medical diagnosis on the basis of both western and oriental medicine.
4. Oriental herbal therapies are often based on using a single herbal remedy at a time.
5. Herbs are classified in a number of ways.
6. The herbalist not only prescribes a mixture of herbs but also prepares remedies for his patients.
7. Acupuncture is not recommended while using herbal medicine.
8. Oriental medicine may be used as a part of the treatment of cancers and other diseases.

Exercise 3. Answer the following questions:

1. Did the Chinese use natural substances in ancient times?
2. What was incorporated into the system operated by Japanese health insurance authorities?
3. What helped to develop Oriental herbal medicine into a highly refined and complex discipline?
4. What is a medical diagnosis made by Chinese practitioners based on?
5. Oriental herbal therapies are based on individually tailored cocktail of herbs, aren't they?
6. Does oriental herbal therapist use one and the same herbal remedy during the course of treatment of a patient as healing proceeds?
7. What is classification of herbs used by oriental therapists based upon?
8. Are characteristics of herbs linked to special affinities with different organs and related emotions involved in a disease?
9. Does the herbalist prescribe a mixture of herbs and explain how to prepare them or give ready-prepared remedies?
10. What is the role of a diet in Chinese medicine?

AYUR VEDA

Exercise 1. Read the explanations of the following words and memorize them.

1. **Chant** – a short simple song in which several syllables or words are sung in one tone;
2. **emetics** – a medicine that causes vomiting;
3. **enema** – *pl.* enemas, enemata – an injection of liquid into the rectum to flush the bowels; clyster;
4. **ether** – the upper regions of space beyond the earth's atmosphere; clear sky;
5. **microcosm** – a man thought of as a miniature representation of the universe;
6. **to palliate** – to lessen without curing, mitigate, to palliate a disease;
7. **to purge** – to wash away all that is not clean from; make clean;
8. **rejuvenation** – the act or process of rejuvenation; restoration of youth, youthful appearance or vigor;
9. **scripture** – 1.=Bible; 2.a particular passage or text of the Bible; Abbr. Script.;
10. **treatise** – a book or other writing dealing with some subject. A treatise is more formal and systematic, than most books or writings;
11. **yoga** – a part of an entire philosophical system of which the ultimate aim is enlightenment – oneness with the Supreme Being, or achieving and maintaining a state of peace and happiness.

Exercise 2. Match the English words in A with the translation in B.

A

1. treatise;
2. enema;
3. to purge;
4. emetic;
5. scripture;
6. to palliate;
7. chant;
8. rejuvenation;
9. ether.

B

- a) давать слабительное, слабить;
- b) временно облегчать боль (болезнь);
- c) монотонное песнопение;
- d) омоложение, восстановление сил;
- e) небо, небеса;
- f) клизма;
- g) рвотное лекарство;
- h) тракт, научный труд;
- i) библия, священное писание.

Exercise 3. Read the text and do the tasks which follow it.

AYURVEDA

Ayurveda, meaning “Science of life” is said to be the oldest and most complete medical system in the world and dates back to c.3000 B.C.. Its roots are in ancient Indian civilization and Indian philosophy, and it has been an important influence on the development of all the other Oriental medical systems. The original source of Ayurveda is the holy scriptures of the *Vedas* and the texts known as the *Samhitas*, which give a treatise on healthcare and describe medical procedures, including surgery and a form of massage of vital energy points. Ayurveda has much in common with Chinese medicine. The human being is viewed as a microcosm of the universe, and both the body and the universe can be seen partly in terms of five elements. In Veda these are space or ether, air, fire, water and earth, and they correspond with the five senses: hearing, touch, sight, taste, and smell, and also with five “senses” of action.

The concepts of life force or energy and balance within the body are important in Ayurvedic as in Chinese medicine. In Ayurvedic medicine the life force is *prana*, similar to the Chinese *chi*. As in Chinese medicine, the functioning of the body is controlled by immaterial forces, linked to physical substances.

These substances are the three basic forces or *doshas* that exist in all things;

Pitta, the force of heat and energy, linked with the sun that controls digestion and all biochemical processes in the body;

Kapha, the force of water and tides, influenced by the moon, the stabilizing influence that controls fluid metabolism in the body;

Vata, linked to the wind, the force that controls movement and the functioning of the nervous system in the body.

When “not abnormal” these three forces ensure that the body is healthy, but when they are “abnormal” or unbalanced disease follows.

Ayurveda emphasizes equilibrium – balance of mind, body and spirit and balanced adaptation to external forces – and it focuses on keeping a person healthy rather than on disease itself.

The cure of a sick patient involves purification and is tailored to the nature and strength of the disease and of the patient. The first stage is generally control of diet, and fasting, combined with practices such as meditation, yoga, and chanting, as well as following advice on posture, sleep, and other lifestyle matters. This alone may effect a cure, but herbal medication also be required to treat excesses with their opposites, (for example, cooling heat symptoms and warming cold symptoms) in order to restore balance.

For stronger disease stronger treatment then required, and this is purification with purges, emetics or enemas, and perhaps also medication to drain or nourish the body, depending on whether the disease is wet or dry. When the disease has been eliminated a period of palliation with rest and careful diet follows. Finally the patient is given rejuvenation therapy to restore full strength. Advice is given on lifestyle, exercise, diet, hygiene, and daily habits.

Ayurvedic medicine is an example of a well-organized system of traditional health care, both preventive and curative, that is widely practiced in parts of Asia. It is still a favoured form of health care in large parts of the Eastern world, especially in India, where a large percentage of the population use this system exclusively or combined with modern medicine. Ayurveda is used all over India and in many developing countries and it is also recognized by the World Health Organization (WHO). The Indian Medical Council was set up in 1971 by the Indian government to establish maintenance of standards for undergraduate and postgraduate education. It establishes suitable qualifications in Indian medicine and recognizes various forms of traditional practice including Ayurvedic, Unani and Siddha. Projects have been undertaken to integrate the indigenous Indian and Western forms of medicine. Most Ayurvedic practitioners work in rural area, providing health care to at least 500,000.000 people in India alone. They therefore represent a major force for primary health care, and their training and employment are important to the government of India.

Like scientific medicine, Ayurvedic medicine has both preventive and curative aspects. The preventive component emphasizes the need for a strict code of personal and social hygiene, the details of which depend upon individual, climatic, and environmental needs. Bodily exercises, the use of herbal preparations, and Yoga form a part of the remedial measures. The curative aspects of Ayurvedic medicine involves the use of herbal medicines, external preparations, physiotherapy and diet.

Exercise 1. Find the English equivalents for the following Russian expressions in the text:

первоначальным источником Аюрведы является; вид массажа жизненно важных энергетических точек; имеет много общего; человек рассматривается как часть вселенной; концепция жизненной силы или энергии и баланса в организме; сила тепла и энергии, связанная с солнцем; сила воды и приливов, усиленная действием Луны; сила ветра, контролирующая движение и функционирование нервной системы; очищение с помощью; омолаживающая терапия; признана Всемирной организацией здравоохранения.

Exercise 2. Agree or disagree with the following statements:

1. The roots of Ayurveda are in ancient Indian civilization and philosophy.
2. Ayurveda has much in common with Egyptian medicine.
3. The life force “prana” in Ayurvedic medicine is similar to the Chinese “chi”.
4. According to Ayurveda the functioning of the body is controlled by two forces.
5. Disease follows if Pitta, Kapha and Vata are abnormal.
6. The cure of a sick patient depends upon the nature and strength of the disease and of the patient.
7. Herbal medications are used to treat excesses with their opposites.
8. To restore full strength a person should follow healthy lifestyle, diet, hygiene, daily habits.
9. Ayurvedic medicine is not recognized by WHO, because it can't be combined with modern medicine.

Exercise 3. Answer the following questions:

1. What does Ayurveda mean?
2. What civilization and philosophy originated Ayurveda?
3. What is considered to be the original source of Ayurveda?
4. How is human being viewed in accordance with Ayurveda?
5. What concept is important in Ayurvedic medicine?
6. According to Ayurveda, Pitta, Kapha, Vata are three important substances that exist in all things, aren't they?
7. What does each of the substances denote?
8. What medicines are used in Ayurvedic medicine to treat a sick person?
9. Are the same techniques used for the cure of stronger disease?
10. Is Ayurveda a recognized practice of healing?
11. What can you say about the system of traditional health care in the Eastern world, especially in India?
12. What specialists represent a major force for primary health care in India? Why?

Exercise 4. Summarize the information given in the text using the key words and word combinations. Use the following phrases:

To begin with, it is ...

It's a well-known fact that ...

Besides ..., also ...

Particularly ...

However ...

Firstly, ... secondly, ... etc.

What is more ...

As regards ...

My point is that ...

In conclusion ...

I would say that ..(..let me say..)

1. **Ayurveda as the “Science of Life”** – the oldest and the most complete medical system, dates back, its roots, to have an important influence on, the original source of, description of medical procedures;
2. **The human being as a microcosm of the universe** – to see the body and the universe in terms of five elements, to correspond with five cognitive senses and with five “senses” of action;
3. **The concept of three life forces** – the balance within the body, equilibrium of mind, body and spirit, three basic forces – Pitta, Kapha and Vata;
4. **Main cures** – purification and palliation, control of diet and fasting, combined practices – meditation and yoga, chanting, herbal medication, for stronger disease - purification and meditation;
5. **A period of health restoration** – palliation, rejuvenation therapy, lifestyle, exercise, diet, hygiene, daily habits.
6. **Ayurvedic medicine as an example of a well-organized system of traditional health-care in Asia** – a favoured form of health care, to be recognized by the WHO, to integrate the indigenous Indian and Western forms of medicine, Ayurvedic practitioners, to represent a major force for primary health care, to have both preventive and curative aspects, to adapt preventive and therapeutic measure to the personal requirements of each patient.

PHYSICAL EXERCISE

Read and memorize the words.

1.	calisthenics [ˌkælsɪsˈθeɪnɪks] <i>n.</i>	- гимнастика, пластика, ритмическая гимнастика;
2.	consistently [kənˈsɪst(ə)ntli] <i>adv.</i>	- последовательно;
3.	endurance [ɪnˈdʒʊərəns] <i>n.</i>	- выносливость;
4.	flabby [ˈflæbi] <i>adj.</i>	- вялый, дряблый;
5.	jogging [ˈdʒɔɡɪŋ] <i>n.</i>	- бег разминочным темпом;

6.	poise [pɔɪz] <i>n.</i>	- манера держаться, осанка; выдержка, самообладание;
7.	posture ['pɒstʃə] <i>n.</i>	- поза, положение;
8.	push-up ['puʃ(ʹ)ʌp] <i>n.</i>	- выжимание в упоре;
9.	stiffness ['stɪfnɪs] <i>n.</i>	- неподвижность, ригидность; тугоподвижность;
10.	strenuous ['strenjuəs] <i>adj.</i>	- требующий силы, усилий, напряжения; напряженный;
11.	stretching ['stretʃɪŋ] <i>n.</i>	- растягивание, вытягивание, потягивание;
12.	suppleness ['sʌplnɪs] <i>n.</i>	- гибкость;
13.	to alleviate [ə'li:vɪət] <i>v.</i>	- облегчать, смягчать; уменьшать;
14.	to impart [ɪm'pɑ:t] <i>v.</i>	- придавать, наделять;
15.	to impede [ɪm'pi:d] <i>v.</i>	- задерживать, препятствовать;
16.	vigor ['vɪgə] <i>n.</i>	- сила, мощь; бодрость;
17.	weight-lifting ['weɪt, lɪftɪŋ] <i>n.</i>	- тяжелая атлетика; поднятие тяжестей;
18.	yoga ['jəʊgə] <i>n.</i>	- йога.

Read the text and do the tasks that follow it.

PHYSICAL EXERCISE

A healthy body is the result of proper nutrition combined with a regular pattern of physical exercise. Exercise imparts vigor and activity to all organs and secures and maintains healthful integrity of all their functions. Exercise improves the tone and quality of muscle tissue and stimulates the processes of digestion, absorption, metabolism, and elimination. It also strengthens blood vessels, lungs, and heart, resulting in improved transfer of oxygen to the cells and increased circulation of the blood and lymph systems. Exercise develops grace, poise, and symmetry of the body, helps in correcting defective development or injuries, and stimulates the mind.

The key to any type of exercise is a strong will and a sincere desire to improve one's physical condition. It is important to have a program that fits individual needs and capacities. A beginning exercise program should be light; it should increase in difficulty gradually as endurance increases. Exercise should not be done for at least an hour after eating because physical exertion may impede digestion. Exercise should be self-motivating and fun. An ideal exercise program may include many different forms of the following physical activities.

Calisthenics

Calisthenics consists of light exercises or gymnastics including sit-ups, push-ups, jumping jacks, etc., which promote grace and health. The emphasis of calisthenics is on building skeletal muscles.

Dancing

Dancing or rhythmic exercise is often an enjoyable way to exercise the body thoroughly and refresh the mind. Besides toning muscles, joints, glands, the respiratory system, and digestive organs, it gives everyday movements grace and poise.

Jogging

Jogging is a form of exercise that consists of alternately walking and running. It is an excellent exercise for improving the heart, lungs, and circulatory system by expanding their capacity to handle stress. It can help build muscle tone, reduce hips and thighs, redistribute weight, and flatten the abdomen.

Stretching

Stretching is natural exercise that should be practised on a regular basis. A good habit to develop is stretching upon rising in the morning and throughout the day. Stretch exercises tend to increase both energy and endurance for all parts of the body. Stretching tends to relieve many aches and pains; loosen up ligaments, joints, and muscles; and increase coordination and suppleness. Stretching stimulates circulation and alleviates the stiffness of contracted muscles.

Walking

Walking is one of the best overall exercises and helps the entire system function better. The metabolism is increased while walking; thus fat is burned up and weight loss is promoted. Blood pressure, blood cholesterol, and sugar levels tend to fall. Walking builds up the heart muscle and keeps the arteries clear and elastic. Walking helps increase the oxygen supply to the blood, thus bringing more oxygen to the heart. It also increases the capacity of the lungs, making more oxygen available to the circulatory system.

Weight-Lifting

Weight-lifting is a form of exercise involving the lifting of weights and is often used by athletes to strengthen muscle tone.

Yoga

Yoga is a series of stretching movements that are performed slowly and methodically. Some postures are quite advanced and complicated for the average person, at least at first; however, there are simple yoga exercises that can be practised by people of all ages with great benefit. The prime goal of yoga is to relieve the body of tension. Yoga, if practised consistently, gives elasticity to the spine, firms the skin, tones flabby muscles, and improves poor posture. Many people feel that yoga increases their endurance and flexibility for participation in other more strenuous activities.

Above all, do not forget the recreational exercises, such as golf, tennis, riding, skating, skiing, etc. There are endless sports that can improve the functioning of the body. The important thing is to remember to exercise *regularly* and maintain a nutritionally balanced diet of good, healthy food.

Exercise 1. Find in the text English equivalents to the Russian word combinations:

1. сильная воля и искреннее желание улучшить физическое состояние;
2. программа, которая соответствует индивидуальным запросам и способностям;
3. отличное упражнение для улучшения функционирования сердца, легких и сердечно-сосудистой системы;
4. практиковать регулярно;
5. улучшать координацию движений и гибкость;
6. во время ходьбы усиливается обмен веществ;
7. она также увеличивает жизненную емкость легких;
8. часто используется спортсменами для укрепления мышечного тонуса;
9. которые могут практиковаться людьми всех возрастных групп с большой пользой.

Exercise 2. Agree or disagree with the following statements:

1. Exercise imparts vigor and activity to all organs and secures and maintains healthful integrity of all their functions.
2. Exercise should be done immediately after eating because physical exertion helps digestion.
3. Calisthenics consists of exercises involving the lifting of weights.
4. Besides toning muscles, joints, glands, the respiratory system, and digestive organs, dancing gives everyday movements grace and poise.
5. Jogging can help build muscle tone, reduce hips and thighs, redistribute weight, and flatten the abdomen.
6. Stretching is natural exercise that should be practised only from time to time.

7. Walking decreases the oxygen supply to the blood, thus bringing less oxygen to the heart.
8. Yoga, if practised consistently, gives elasticity to the spine, firms the skin, tones flabby muscles, and improves poor posture.
9. It is important to exercise regularly and maintain a nutritionally balanced diet of good, healthy food.

Exercise 3. Answer the following questions:

1. What benefit do people get from physical exercise?
2. What requirements should a beginning exercise program meet?
3. What does calisthenics consist of?
4. Why is dancing or rhythmic exercise so useful?
5. What form of exercise consists of alternately walking and running?
6. Why is stretching upon rising in the morning and throughout the day considered to be a good habit to develop?
7. What exercise is often used by athletes to strengthen muscle tone?
8. Can all yoga exercises be practised by people of all ages for the benefit of their health?
9. Why is walking one of the best overall exercises?
10. What recreational exercises can also improve the functioning of the body?

Exercise 4. Mind that the average calorie expenditure of a normally active 67.5 – kilogram man is about 2700 calories a day. Individual calorie requirements vary according to age, sex, build, level of activity, and metabolic rate. If a person takes in more calories than he or she needs, a weight gain results. Study the table given below and say what activities are preferred or practised by you to be fit.

Comment on your choice.

<i>EXPENDITURE OF CALORIC ENERGY PER HOUR</i>	
Activity	Calories Expended per Hour
Ballroom dancing	330
Bed making	234
Bicycling 5 ½ mph	210
Bowling	264
Driving a car	168
Farm work in field	438
Gardening	220
Horseback riding (trot)	480
Ironing (standing up)	252

Lawn mowing (hand mower)	462
Piano playing	150
Preparing a meal	198
Roller skating	350
Running 10 mph	900
Sitting and eating	84
Sitting and knitting	90
Sitting in a chair reading	72
Skiing	594
Sleeping (basal metabolism)	60
Standing up	138
Sweeping	102
Swimming (leisurely)	300
Tennis	420
Volleyball	350
Walking (2.5 miles per hour)	216
Walking downstairs	312

***Exercise 5.** Making exercise part of your life can be difficult at first, but it's important to make fitness a lifetime commitment. Below are some suggestions for helping you stick with your exercise program.*

- Set realistic goals. Do not expect to make monumental progress in a week. Begin slowly and increase difficulty and duration of exercise periods as you go.
- Do not overdo it too soon. If you overexert yourself, you will increase the likelihood for injury and you will have sore muscles. These unpleasant experiences may discourage you from continuing.
- Work out a time that best suits your body. Some people can exercise in the morning with no problem. Others prefer the evening as a way of releasing the tension of the day.
- Write down your activities and time spent exercising. Keeping track of your progress allows you to see your improvements, which will motivate you to continue.
- Do not depend on a scale. Too often, beginning exercisers use the scale as a means to measure progress. This can quickly become discouraging as many people may gain weight from fluid retention at the onset of an exercise program. Weigh yourself no more than once a week and always use the same scale when you do.
- Vary your routine. Run, walk, or cycle a different route each time you go out.
- Get the support of others or exercise with a friend. Family members can be especially helpful in motivating you to stay on your program. Exercising with a group also helps motivate.

- Don't let lapses get you down. If you miss an exercise session or two, don't dwell on it. Just get back into your program as soon as you can.

AROMATHERAPY

Read and memorize the words.

1.	acne ['æknɪ] <i>n.</i>	- угорь, прыщ;
2.	blister ['blɪstə] <i>n.</i>	- водяной пузырь, волдырь;
3.	burn [bɜ:n] <i>n., v.</i>	- ожог; обожженное место; обжигать, получать ожог;
4.	distraction [dɪs'trækʃ(ə)n] <i>n.</i>	- помрачение рассудка; безумие;
5.	essential oil [ɪ'senʃəl 'oɪl]	- эфирное летучее масло растительного или животного происхождения;
6.	eucalyptus [ju:kə'liptəs] <i>n.</i>	- эвкалипт;
7.	fragrant ['freɪgr(ə)nt] <i>adj.</i>	- ароматный, благоухающий; благоуханный;
8.	hangover ['hæŋ, ɒvə] <i>v.</i>	- похмелье;
9.	lavender ['lævɪndə] <i>n.</i>	- лаванда: высушенные цветы и листья лаванды;
10.	nick [nɪk] <i>n.</i>	- надрез, порез;
11.	potent ['pout(ə)nt] <i>adj.</i>	- сильный, сильнодействующий; крепкий;
12.	portion ['rouʃ(ə)n] <i>n.</i>	- доза лекарства; настойка; микстура; зелье, снадобье;
13.	restorative [rɪs'to(:)rətɪv] <i>n.</i>	- тонизирующее, укрепляющее средство;
14.	rind ['raɪnd] <i>n.</i>	- кора (дерева); кожица, кожура (плода); шелуха;
15.	account [ə'kaunt] (for) <i>v.</i>	- объяснять;
16.	plunge [plʌŋ(d)ʒ] <i>v.</i>	- погружать; окунать; опускать в ... ;
17.	ravage ['rævɪdʒ] <i>v.</i>	- подвергать разрушительному действию;
18.	soothe [su:ð] <i>v.</i>	- успокаивать; смягчать, облегчать;
19.	vat [væt] <i>n.</i>	- чан; бочка.

Read the text and do the exercises that follow it.

AROMATHERAPY

The Egyptians were the first to distil plants in order to extract their essential oils. They used them medicinally, in religious ceremonies, as beautifying skin and face potions and perfumes.

Although aromatherapy is based on more than 6000 years' knowledge, the term was first used only 75 years ago. A French chemist named Gattefosse' owned a perfumery business. One day he burnt his hand, plunged it into a vat of Lavender oil and found the burn healed quickly. This began a lifelong interest in studying the therapeutic properties of plant oils. Recently biochemists have isolated dozens of ingredients in essential oils that account for the amazing properties they have.

Essential oils come from plants and the liquid is held in tiny sacks somewhere on the plant. It may be taken from the petals, roots, rind, stalk, seeds, sap, nuts, leaves or the bark. It is important to obtain essential oils from a reputable source. It is now possible to buy fine oils from specialist beauty outlets, mail order companies, health food shops and many drug stores. Apart from using the oils in massage, the most widely known method, oils can become a major ingredient in beauty treatments, can be added to baths as a restorative, or used in the home to add aroma.

Many essential oils have powerful disinfectant properties that kill germs and improve hygiene and they do not need the addition of environmentally damaging chemicals to help them clean effectively.

Essential oils also make excellent natural, fragrant, non-toxic insecticides which are kind to humans but repulsive to insects (Camphor, Citronella, Lemongrass, Geranium, Tea Tree, etc.).

Relaxing in a warm, steamy bath with added essential oils is the most relaxing aromatherapy treatment possible. In this atmosphere the oils release even more aroma molecules than during massage, and as you lie soaking in the hot water the atmosphere softens skin and speeds up oil absorption, allowing the essential oils to work their magic more potently on both mind and body. You can use essential oils in the bath to give almost any effect. Depending on which oils you use, they can energize, relax, soothe, relieve aches and treat a cold, hangover or headache.

The anti-bacterial and antiseptic properties of essential oils make them excellent for use to provide relief for many minor health problems. Many essential oils have a soothing and healing effect on problem skin. They also soothe the mental stresses that can make acne worse.

The blisters and inflammation of burnt skin are very susceptible to infection. The anti-bacterial and antiseptic properties of essential oils help

protect the area while new skin grows and some essential oils such as lavender, help speed up the natural healing process.

The common cold is so infectious it is almost inescapable during winter. Caused by a wide range of ever-changing viruses, symptoms can include a high temperature, aching, sore eyes, sore throat, coughing, sneezing and chest and nose congestion. Essential oils can help soothe some of these symptoms.

An irritating cough, caused by anything from dust and cigarette smoke to the common cold, can drive anyone to distraction. Inhaled essential oils are effective at soothing a cough.

Essential oils are excellent at soothing, disinfecting and healing minor cuts and skin abrasions from nappy rash to shaving nicks.

Influenza is a more serious viral infection than the common cold and puts most people in bed for a couple of days. Essential oils (Eucalyptus, Lime, Peppermint, Rosemary, Orange, etc.) can soothe some of the symptoms and help to prevent the virus taking too firm a hold on the flu-ravaged body.

Not being able to sleep is deeply irritating, exhausting, and distressing but worrying about it won't help. Instead of lying there counting sheep have an aromatherapy bath. Use oils with calming, sedative qualities: Basil, Chamomile, Geranium, Jasmine, Lavender, Mandarin, Sandalwood, Valerian, Rose, Mimosa, etc.

Using essential oils is a pleasurable experience, stimulating the sense of smell, moods, behaviour and mental and physical well-being. These are the basic rules to ensure the proper use of the essential oils:

- Essential oils are potent. Only ever measure them out in drops.
- Never apply undiluted essential oils to skin.
- Never take essential oils internally.
- Never increase the dose of essential oil. Some oils are toxic in large amounts.
- Apply essential oils only as instructed for treating common ailments. If symptoms persist seek medical advice.
- Always keep essential oils out of reach of children.
- Don't shower or bath preferably for 24 hours (12 hours if this is not possible) after an aromatherapy massage. Oils take that long to fully penetrate the skin.
- Don't store essential oils, pure or diluted, in plastic containers. They could become contaminated.

Exercise 1. Find in the text English equivalents to the Russian word combinations:

1. использовали в лечебных целях;
2. опустил ее (руку) в чан с лавандовым маслом;
3. лечебные свойства растительных масел;

4. получать эфирные летучие масла растительного или животного происхождения из надежного источника;
5. добавление химических веществ, оказывающих вредное воздействие на окружающую среду;
6. в зависимости от того, какие масла вы используете;
7. оказывать успокаивающее и заживляющее воздействие;
8. ускорять естественный процесс заживления;
9. сводить кого-либо с ума; доводить кого-либо до отчаяния;
10. основные правила, гарантирующие правильное использование эфирных летучих масел растительного или животного происхождения.

Exercise 2. Agree or disagree with the following statements:

1. The Chinese were the first to distil plants in order to extract their essential oils.
2. Although aromatherapy is based on more than 6000 years' knowledge, the term was first used only 75 years ago.
3. There are no essential oils that have powerful disinfectant properties killing germs and improving hygiene.
4. Essential oils make excellent natural, fragrant, non-toxic insecticides which are kind to humans but repulsive to insects.
5. As you lie soaking in the hot water the atmosphere softens skin and speeds up oil absorption, allowing the essential oils to work their magic more potently on both mind and body.
6. The blisters and inflammation of burnt skin are not susceptible to infection.
7. The common cold is so infectious it is almost inescapable during summer.
8. Inhaled essential oils are effective at soothing a cough.
9. Essential oils are excellent at soothing, disinfecting and healing minor cuts and skin abrasions.

Exercise 3. Answer the following questions:

1. What event began a lifelong interest in studying the therapeutic properties of plant oils?
2. What do essential oils come from?
3. Essential oils can energize, relax, soothe, relieve aches and treat a cold, hangover or headache, can't they?
4. What are the symptoms of the common cold? Can essential oils help soothe any of these symptoms?
5. What oils can be used if you are not able to sleep?
6. Can undiluted essential oils be applied to skin?
7. What should be done if you apply essential oils as instructed for treating common ailments, but symptoms persist?
8. Why shouldn't essential oils, pure or diluted, be stored in plastic containers?

Exercise 4. What is your attitude towards aromatherapy? Do you practise it if you have health problems? What essential oils do you prefer to use? What for?

Exercise 5. Below you will find the information about some rapid remedies using essential oils. Study it and follow these pieces of advice if necessary.

Lavender

LAVANDULA AUGUSTIFOLIA

Probably the most useful, versatile and popular essential oil, Lavender was a favourite bathtime cleanser with the Romans. It is native to the Mediterranean region and cultivated in many countries in Europe, most particularly France, Italy and the United Kingdom.

HOW LAVENDER OIL WORKS

Depending on how it is used, and the other oils with which it is mixed, Lavender can be either stimulating or relaxing. It is also a powerful antiseptic and healer.

Excellent for tension, tiredness and depression, Lavender calms, refreshes, invigorates and lifts the spirits. A very safe essential oil, it can be used in many ways, including for massage, baths and inhalations.

WHAT LAVENDER OIL MIXES WITH

The addition of a second oil can sometimes improve an oil's therapeutic properties. For instance, the anti-inflammatory action of Chamomile is strengthened by the addition of Lavender.

Lavender mixes with almost all the other essential oils. However, in all cases it is best not to mix more than three essential oils together. The best rule is to keep mixes simple. Lavender goes particularly well with the other floral oils: Geranium, Jasmine, Mimosa, Neroli, Rose, Violet and Ylang-ylang.

Rapid remedies using Lavender oil

- * Add 8-10 drops Lavender oil to a hot bath to relieve anxiety and make you feel pleasantly drowsy.
- * In a cool bath use 4 drops Lavender mixed with 4 drops Thyme and 2 drops Peppermint to refresh and energize.
- * Add 5 drops Lavender oil to 1 litre of boiling water in a bowl and inhale this to clear the head and lift the spirits.

Lemon

CITRUS LIMON

Cleansing and invigorating, Lemon oil was used by the ancient Romans to counteract stomach upsets and to sweeten the breath.

The British Navy once used it to prevent scurvy.

The oil is extracted from the fresh rind of the fruit and lemons are grown for this purpose in Spain, Florida, Portugal, Italy, Israel and California.

HOW LEMON OIL WORKS

Lemon oil, with its tangy, fresh citrus smell, is stimulating, invigorating and astringent. It is also deodorizing, diuretic and antiseptic.

Lemon is used for clearing the head during a cold or when you are mentally exhausted. It provides energy for an aching body and boosts circulation, warming hands and feet. Lemon can also be used for treating cellulite.

Use Lemon oil for massage, baths and inhalations.

WHAT LEMON OIL MIXES WITH

Lemon oil mixes with almost all the widely used essential oils. However do not use it with other citrus oils or Angelica, Camphor, Galbanum, Ginger, Mimosa, Tarragon, Valerian, Violet and Yarrow.

Rapid remedies using Lemon oil

- * Inhale 2 drops of Lemon oil from a tissue placed on the pillow or in a breastpocket to relieve the symptoms of a cold.
- * On a cold night boost your circulation with up to 3 drops (2 drops for a sensitive skin) in a hot bath.
- * Add 2-3 drops to a cleaning cloth to wipe over surfaces and act as a deodorizer in the home.

WARNING

Lemon oil can cause skin irritation unless thoroughly diluted. Use only small quantities, less than one third the quantity recommended for other oils. Do not expose the skin to sunshine for at least six hours after application.

Eucalyptus

EUCALYPTUS GLOBULUS

The distinctive smell of Eucalyptus oil is easily recognized. It was a favourite medicinal herb with native Australians, the Aborigines, who crushed the leaves to heal wounds, fight infection and relieve muscular pain. The wood was also used on cooking fires to add flavour to food. The oil is extracted from the twigs and leaves of the Blue Gum tree. A native of Australia, the tree is now grown commercially in California, Spain and Portugal.

HOW EUCALYPTUS OIL WORKS

The oil is stimulating and has been used in cough and cold remedies for decades. A powerful antiseptic, it kills airborne germs and has a cooling effect on the skin. It is an excellent decongestant for fever, flu, coughs, colds or sinusitis. It soothes muscular aches, sprains and pains and helps to heal abrasions. Use Eucalyptus oil in massage, baths and inhalations.

WHAT EUCALYPTUS OIL MIXES WITH

Eucalyptus oil can be mixed with about half of the most widely used essential oils including Angelica, Basil, Bay, Atlas Cedarwood, Chamomile, Frankincense, Geranium, Ginger, Juniper, Laurel, Lavender, Lemon, Marjoram, Peppermint, Pine, Rosemary, Clary Sage, Sandalwood, Spruce, Tea Tree and Thyme.

Rapid remedies using Eucalyptus oil

- * Place a few drops in a dish of hot water over a radiator to disinfect a room.
- * Add 5 drops to a hot bath to relieve congestion during a cough or cold.
- * Dilute with carrier oil and massage into aching muscles.

Jasmine

JASMINUM OFFICINALE

Prized, above all, for its romantic, rich, exotic scent Jasmine makes almost everyone who smells it feel better. Jasmine is the special ingredient in most of the great, classic perfumes, adding a distinctive, sensual appeal. It takes eight million flowers, all hand picked before dawn, to extract just one kilogram of oil and this makes Jasmine one of the most expensive essential oils. It is grown in France, Egypt, Morocco, India and Italy.

HOW JASMINE OIL WORKS

The oil is deep red in colour and smells as fragrant as the tiny white star-shaped flowers it comes from. Jasmine oil is uplifting and relaxing, leaving the recipient confident, optimistic and slightly euphoric. It is good for dry or sensitive skins and for aches and cramps. Jasmine oil can be used in massage, for baths and inhalations. Use it to treat depression, stress, fatigue, irritability or apathy. It is also good for PMT and is an excellent skin softener.

WHAT JASMINE OIL MIXES WITH

Mix with Bergamot, Atlas Cedarwood, Chamomile, Geranium, Ginger, Lavender, Lemon, Lemongrass, Mimosa, Patchouli, Roe, Rosewood, Clary Sage, Sandalwood, and Ylang-ylang.

Rapid remedies using Jasmine oil

- * Add 8 drops Jasmine oil to a bath to counteract stress or fatigue.
- * Place up to 8 drops in a vaporizer, or add 12 drops to the wood for a fire before you light it. This will scent the room and create a mellow atmosphere for a dinner party.
- * Add 2 drops Jasmine oil to a basin of warm water for a final face rinse after cleansing. Leave to dry naturally to help to soften the skin.

UNIT V. NUTRITION. VITAMINS AND MINERALS. MEDICINES

SOURCES OF CALORIES: CARBOHYDRATES, FATS, AND PROTEIN

Carbohydrates, fats, and proteins are the primary sources of energy to the body because they supply fuel necessary for body heat and work. Their fuel potential is expressed in *calories*, a term that signifies the amount of chemical energy that may be released as heat when food is metabolized. Therefore foods that are high in energy value are high in calories, while foods that are low in energy value are low in calories. Fats yield approximately 9 calories per gram, and carbohydrates and proteins yield approximately 4 calories per gram.

CARBOHYDRATES

Read and memorize the words.

1.	carbohydrates [ˌkɑːbɔ(ʊ)'haɪdr(e)ɪt] <i>n.</i>	- хим. углевод;
2.	exertion [ɪg'zɜːʃ(ə)n] <i>n.</i>	- напряжение; усилие, старание;
3.	assimilation [ə'sɪmɪ'leɪʃ(ə)n] <i>n.</i>	- физиол. усвоение питательного материала, ассимиляция;
4.	honey ['hʌni] <i>n.</i>	- мёд; цветочный сок, медок; сироп, искусственный мёд;
5.	skin [skɪn] <i>n.</i>	- кожа; кожура, кожица; оболочка; пленка; верхний или наружный слой;
6.	indigestible [ˌɪndɪ'dʒestəbl] <i>adj.</i>	- трудно перевариваемый, неудобоваримый;
7.	bulk [bʌlk] <i>n.</i>	- объем, масса; величина; большое количество; основная масса, большая часть;
8.	convert [kən'vɜːt] <i>v.</i>	- превращать; перерабатывать; переходить из одного состояния в другое;
9.	snack [snæk] <i>n.</i>	- легкая закуска; перекус на ходу;
10.	craving ['kreɪvɪŋ] <i>n.</i>	- страстное желание; стремление;

11.	fatigue [fə'ti:g] <i>n.</i>	- утомление, усталость; утомительность;
12.	dizziness ['dɪzɪnɪs] <i>n.</i>	- головокружение;
13.	overindulgence ['ɔv(ə)rɪn'dʌldʒ(ə)ns] <i>n.</i>	- чрезмерное увлечение (чем-л.); злоупотребление (чем-л.);
14.	starchy ['stɑ:tʃɪ] <i>adj.</i>	- крахмалистый, крахмальный, содержащий крахмал;
15.	crowd [kraud] out <i>v.</i>	- вытеснять;
16.	perpetuate [pə'petjuert] <i>v.</i>	- сохранять навсегда;
17.	indigestion [ˌɪndɪ'dʒestʃ(ə)n] <i>n.</i>	- несварение; расстройство желудка; диспепсия; нарушение пищеварения;
18.	overabundance ['ɔv(ə)r ə'bʌndəns] <i>n.</i>	- избыточность, избыток;
19.	basal ['beɪsl] <i>adj.</i>	- основной; лежащий в основе; главный;
20.	ketosis [kɪ'tɔsɪs] <i>n.</i>	- избыточное образование кетоновых тел, накопление в теле кетоновых тел, кетоз.

Read the text and do the exercises that follow it.

CARBOHYDRATES

Carbohydrates are the chief source of energy for all body functions and muscular exertion and are necessary to assist in the digestion and assimilation of other foods. Carbohydrates provide us with immediately available calories for energy by producing heat in the body when carbon in the system unites with oxygen in the bloodstream. Carbohydrates also help regulate protein and fat metabolism; fats require carbohydrates for their breakdown within the liver.

The principal carbohydrates present in foods are sugars, starches, and cellulose. Simple sugars, such as those in honey and fruits, are very easily digested. Double sugars, such as table sugar, require some digestive action, but they are not nearly as complex as starches, such as those found in whole grain. Starches require prolonged enzymatic action in order to be broken down into simple sugars (glucose) for digestion. Cellulose, commonly found in the skins of fruits and vegetables, is largely indigestible by humans and contributes little energy value to the diet. It does, however, provide the bulk necessary for intestinal action and aids elimination.

All sugars and starches are converted by the body to a simple sugar such as "glucose or fructose." Some of the glucose, or "blood sugar," is used as fuel by tissues of the brain, nervous system, and muscles. A small portion of the

glucose is converted to glycogen and stored by the liver and muscles; the excess is converted to fat and stored throughout the body as a reserve source of energy. When fat reserves are reconverted to glucose and used for body fuel, weight loss results.

Carbohydrate snacks containing sugars and starches provide the body with almost instant energy because they cause a sudden rise in the blood sugar level. However, the blood sugar level drops again rapidly, creating a craving for more sweet food and possibly fatigue, dizziness, nervousness, and headache.

Overindulgence in starchy and sweet foods may crowd out other essential foods from the diet and can therefore result in nutritional deficiency as well as in obesity and tooth decay. Diets high in refined carbohydrates are usually low in vitamins, minerals, and cellulose. Such foods as white flour, white sugar, and polished rice are lacking in the B vitamins and other nutrients. Excessive consumption of these foods will perpetuate any vitamin B deficiency an individual may have. Enriched products may include some of the B vitamins. If the B vitamins are absent, carbohydrate combustion cannot take place, and indigestion, symptoms of heartburn, and nausea can result. Research continues as to whether or not such problems as diabetes, heart disease, high blood pressure, anemia, kidney disorders, and cancer can be linked to an overabundance of refined carbohydrate foods in the diet.

Carbohydrates can be manufactured in the body from some amino acids and the glycerol component of fats.

Differences in basal metabolism, amount of activity, size, and weight will influence the amount of carbohydrates the body needs to get from an outside source. However, a total lack of carbohydrates may produce ketosis, loss of energy, depression, and breakdown of essential body protein.

Exercise 1. Find in the text English equivalents to the following Russian word combinations:

главный источник энергии; усвоение других питательных веществ; регулировать белковый и жировой метаболизм; для расщепления в печени; в кожуре фруктов и овощей; обеспечивать основной объем, необходимый для ...; запасной источник энергии; вызывать резкий подъем уровня сахара, содержащегося в крови; вызывать усталость, головокружение, повышенную возбудимость и головную боль; вытеснять другие основные пищевые продукты из рациона; приводить к дефициту питательных веществ, а также к ожирению; быть связанным с избытком; различия в основном метаболизме.

Exercise 2. Agree or disagree with the following statements:

1. Carbohydrates provide us with immediately available calories for energy by producing heat in the body when carbon in the system unites with oxygen in the bloodstream.
2. Double sugars, such as table sugar, require no digestive action.
3. Cellulose, commonly found in the skins of fruits and vegetables, is easily digested by humans.
4. Some of the glucose, or “blood sugar”, is used as fuel by tissues of the brain, nervous system, and muscles.
5. When fat reserves are reconverted to glucose and used for body fuel, a gain in weight results.
6. Diets high in refined carbohydrates are usually low in vitamins, minerals, and cellulose.
7. Carbohydrates cannot be manufactured in the body.
8. Differences in basal metabolism, amount of activity, size, and weight will influence the amount of carbohydrates the body needs to get from an outside source.

Exercise 3. Answer the following questions:

1. What are carbohydrates necessary for?
2. In what way do carbohydrates provide the body with immediately available calories for energy?
3. What are the principle carbohydrates present in foods?
4. What do starches require in order to be broken down into glucose for digestion?
5. Why do carbohydrate snacks provide the body with almost instant energy?
6. What can overindulgence in starchy and sweet foods result in?
7. What happens if the B vitamins are absent in the diet?
8. Are such problems as diabetes, heart disease, high blood pressure, anemia, kidney disorders, and cancer anyhow linked to an overabundance of refined carbohydrate foods in the diet?
9. What may a total lack of carbohydrates lead to?

FATS

Read and memorize the words.

1.	furnish ['fɜːnɪʃ] v.	- снабжать, предоставлять; доставлять;
2.	carrier ['kæriə] n.	- носитель; носитель патогенных микробов, бациллоноситель;

3.	conversion [kən'veɪʃ(ə)n] <i>n.</i>	- превращение, преобразование (состояния), трансформация;
4.	carotene ['kærəti:n] <i>n.</i>	- каротин;
5.	deposit [dɪ'pɒzɪt] <i>n.</i>	- отложение, осадок; налёт;
6.	insulate ['ɪnsjuleɪt] <i>v.</i>	- обособливать, отделять от окружающих, изолировать;
7.	hydrochloric acid ['haɪdrə'klɔːrɪk] <i>n.</i>	- соляная кислота, хлористоводородная кислота;
8.	fullness ['fʊlnɪs] <i>n.</i>	- полнота; сытость;
9.	melt [melt] <i>v.</i>	- таять, плавить (ся), растапливать (ся); растворяться;
10.	saturate ['sætʃəreɪt] <i>v.</i>	- насыщать, сатурировать; пропитывать;
11.	safflower ['sæflaʊə] <i>n.</i>	- бот. сафлор;
12.	shortening ['ʃɔːtnɪŋ] <i>n.</i>	- укорачивание, уменьшение; сокращение, урезывание; кул. шортенинг (жир, добавляемый в тесто для рассыпчатости);
13.	hydrogenation ['haɪdrədʒɪ'neɪʃn] <i>n.</i>	- гидрогенизация; соединение с водородом;
14.	youthful ['juːθf(ʊ)l] <i>adj.</i>	- юный, молодой;
15.	scaliness ['skeɪlɪnɪs] <i>n.</i>	- чешуйчатость; шероховатость;
16.	lubricate ['luːbrɪkeɪt] <i>v.</i>	- смазывать; обладать смазочными свойствами;
17.	rancidity [ræn'sɪdɪtɪ] <i>n.</i>	- прогорклый вкус (запах), прогорклость, прогоркание;
18.	retarded [rɪ'taɪdɪd] <i>adj.</i>	- замедленный; запоздалый; отсталый;
19.	compatible [kəm'pætəbl] <i>adj.</i>	- совместимый; сочетаемый.

Read the text and do the exercises that follow it.

FATS

Fats, or lipids, are the most concentrated source of energy in the diet. When oxidized, fats furnish more than twice the number of calories per gram furnished by carbohydrates or proteins. One gram of fat yields approximately 9 calories to the body.

In addition to providing energy, fats act as carriers for the fat-soluble vitamins, A, D, E, and K. By aiding in the absorption of vitamin D, fats

help make calcium available to body tissues, particularly to the bones and teeth. Fats are also important for the conversion of carotene to vitamin A. Fat deposits surround, protect, and hold in place organs, such as the kidneys, heart, and liver. A layer of fat insulates the body from environmental temperature changes and preserves body heat. This layer also rounds out the contours of the body. Fats prolong the process of digestion by slowing down the stomach's secretions of hydrochloric acid. Thus fats create a longer-lasting sensation of fullness after a meal.

The substances that give fats their different flavors, textures, and melting points are known as the "fatty acids." There are two types of fatty acids, saturated and unsaturated. Saturated fatty acids are those that are usually hard at room temperature and which, except for coconut oils, come primarily from animal sources. Unsaturated fatty acids, including polyunsaturates, are usually liquid at room temperature and are derived from vegetable, nut, or seed sources, such as corn, safflowers, sunflowers, and olives. Vegetable shortenings and margarines have undergone a process called "hydrogenation" in which unsaturated oils are converted to a more solid form of fat. Other sources of fat are milk products, eggs, and cheese.

There are three "essential" fatty acids: linoleic, arachidonic, and linolenic, collectively known as unsaturated fatty acids. Arachidonic and linolenic acids are unsaturated fatty acids necessary for normal growth and healthy blood, arteries, and nerves. Also, they keep the skin and other tissues youthful and healthy by preventing dryness and scaliness. Essential fatty acids may be necessary for the transport and breakdown of cholesterol.

Cholesterol is a lipid or fat-related substance necessary for good health. It is a normal component of most body tissues, especially those of the brain and nervous system, liver, and blood. It is needed to form sex and adrenal hormones, vitamin D, and bile, which is needed for the digestion of fats. Cholesterol also seems to play a part in lubricating the skin.

Although a cholesterol deficiency is unlikely to occur, abnormal amounts of cholesterol may be stored throughout the body if fats are eaten excessively. Research continues, as to the relationship of increased cholesterol storage to the development of arteriosclerosis.

Fat and fat-containing foods should be stored in covered containers, away from direct light, and in a cool place to prevent rancidity caused by oxidation. Some protection from rancidity will be provided by vitamin E, a fat-soluble vitamin that is a natural antioxidant and is present in most fat-containing foods.

Although a fat deficiency rarely occurs in man, such a deficiency would lead to a deficiency in the fat-soluble vitamins. A deficiency of fatty acids may produce eczema or other skin disorders. An extreme deficiency could lead to severely retarded growth.

Excessive amounts of fat in the diet may lead to abnormal weight gain and obesity if more calories are consumed than are needed by the body. In addition to obesity, excessive fat intake will cause abnormally slow digestion and absorption, resulting in indigestion. If a lack of carbohydrates is accompanied by a lack of water in the diet, or if there is a kidney malfunction, fats cannot be completely metabolized and may become toxic to the body.

Fat content of the diet varies widely among individuals. Linoleic acid, however, should provide about 2 percent of the calories in the diet. Vegetable fats, such as corn, safflower, and soybean oils, are high in linoleic acid. Nutritionists suggest that an intake of fat providing 25 to 30 percent of the calories is compatible with good health.

Exercise 1. Find in the text English equivalents to the following Russian word combinations:

при окислении жиры предоставляют ...; действовать как носители для жирорастворимых витаминов; превращение каротина в витамин А; изменения температуры окружающей среды; ощущение сытости после приема пищи; известные как “жирные кислоты”; насыщенные и ненасыщенные; жидкие при комнатной температуре; линолевая, арахидоновая и линоленовая кислоты; предотвращать прогорклый вкус, вызываемый окислением; недостаточность жирорастворимых витаминов; становиться токсичными для организма.

Exercise 2. Agree or disagree with the following statements:

1. When oxidized, fats furnish less than twice the number of calories per gram furnished by carbohydrates or proteins.
2. By aiding in the absorption of vitamin D, fats help make calcium available to body tissues.
3. Fats create a longer-lasting sensation of fullness after a meal.
4. Saturated fatty acids are usually hard at room temperature and come primarily from animal sources.
5. Arachidonic and linolenic acids are saturated fatty acids necessary for normal growth and healthy blood, arteries, and nerves.
6. A fat deficiency often occurs in man.
7. Fat content of the diet varies widely among individuals.
8. Vegetable fats, such as corn, safflower, and soybean oils, are low in linoleic acid.

Exercise 3. Answer the following questions:

1. Are fats the most concentrated source of energy in the diet? Prove that.
2. What is the role of fat deposits in the body?
3. Why do fats create a longer-lasting sensation of fullness after a meal?

4. What substances are known as the “fatty acids”?
5. What is the difference between saturated and unsaturated fatty acids?
6. What fatty acids keep the skin and other tissues youthful and healthy?
7. What is cholesterol? What is it needed for?
8. How should fat and fat-containing foods be stored? Why is it necessary?
9. What may a deficiency of fatty acids in man lead to?
10. What may be the consequences of excessive amounts of fat in the diet?

Exercise 4. Study these tips concerning the use of fats. Comment upon them.

- **Eat less fat.** Reduce your fat intake so that less than 30% of all calories consumed each day come from fats.
- **Eat less saturated fat.** Less than 10% of your calories should come from saturated fat, such as that in cheese, butter, and meat.
- **Limit your polyunsaturated fats.** Less than 10% of your calories should come from polyunsaturated fat, such as that in safflower oil, soybean oil, and sunflower oil. Especially limit your intake of hydrogenated vegetable oils, found in so many processed foods.
- **Eat monounsaturated fats in place of other fats.** Olive and canola oils are the best choices among vegetable oils because they are highest in monounsaturated fat and among the lowest in saturated fat: use them instead of butter or margarine, when possible.

PROTEIN

Read and memorize the words.

1.	plentiful ['plentɪf(u)l] <i>adj.</i>	- обильный; изобильный;
2.	vitality [və'tælɪtɪ] <i>n.</i>	- жизненность; жизнеспособность; живучесть; жизненная сила; энергия; живость, энергичность;
3.	lactation [læk'teɪʃ(ə)n] <i>n.</i>	- выделение молока; образование молока; лактация; кормление грудью; период грудного кормления;
4.	clotting ['klɒtɪŋ] <i>n.</i>	- свертывание (крови, лимфы), образование сгустка (тромба);
5.	spare [speə] <i>v.</i>	- беречь, сберегать; экономить;
6.	sufficient [sə'fɪʃ(ə)nt] <i>adj.</i>	- достаточный;
7.	decompose [ˌdi:kəm'pəʊz] <i>v.</i>	- разлагать на составные части;

		распадаться; разлагаться;
8.	simultaneously [ˌsɪm(ə)l'teɪnjəsli] <i>adv.</i>	- одновременно; совместно;
9.	figure ['fɪgə] <i>v.</i>	- вычислять; понимать, постигать;
10.	attain [ə'teɪn] <i>v.</i>	- достигать, добиваться; достигать, добираться; достичь какого-л. возраста, дожить; приобретать, получать;
11.	stature ['stætʃə] <i>n.</i>	- телосложение; рост; развитие;
12.	kwashiorkor [ˌkwɒʃɪ'ɔːkɔː] <i>n.</i>	- квашиоркор, детская пеллагра;
13.	stunted ['stʌntɪd] <i>adj.</i>	- низкорослый, чахлый, карликовый;
14.	vigor ['vɪgə] <i>n.</i>	- сила; мощь, мощность; бодрость; живость, энергия;
15.	stamina ['stæmɪnə] <i>n.</i>	- жизнеспособность, жизненные силы; стойкость, сопротивляемость, выносливость;
16.	worn-out ['wɔːn'ɑʊt] <i>adj.</i>	- изношенный; сносившийся; изнуренный; старый.

Read the text and do the exercises that follow it.

PROTEIN

Next to water, protein is the most plentiful substance in the body. Protein is one of the most important elements for the maintenance of good health and vitality and is of primary importance in the growth and development of all body tissues. It is the major source of building material for muscles, blood, skin, hair, nails, and internal organs, including the heart and the brain.

Protein is needed for the formation of hormones, which control a variety of body functions such as growth, sexual development, and rate of metabolism. Protein also helps prevent the blood and tissues from becoming either too acid or too alkaline and helps regulate the body's water balance. Enzymes, substances necessary for basic life functions, and antibodies, which help fight foreign substances in the body, are also formed from protein. In addition, protein is important in the formation of milk during lactation and in the process of blood clotting.

As well as being the major source of building material for the body, protein may be used as a source of heat and energy, providing 4 calories per

gram of protein. However, this energy function is spared when sufficient fats and carbohydrates are present in the diet. Excess protein that is not used for building tissue or energy can be converted by the liver and stored as fat in the body tissues.

During digestion the large molecules of proteins are decomposed into simpler units called “amino acids.” Amino acids are necessary for the synthesis of body proteins and many other tissue constituents. They are the units from which proteins are constructed and are the end products of protein digestion.

The body requires approximately twenty-two amino acids in a specific pattern to make human protein. All but eight of these amino acids can be produced in the adult body. The eight that cannot be produced are called “essential amino acids” because they must be supplied in the diet. In order for the body to properly synthesize protein, all the essential amino acids must be present simultaneously and in the proper proportions. If just one essential amino acid is low or missing, even temporarily, protein synthesis will fall to a very low level or stop altogether. The result is that *all* amino acids are reduced in the same proportion as the amino acid that is low or missing.

Foods containing protein may or may not contain all the essential amino acids. When a food contains all the essential amino acids, it is termed “complete protein.” Foods that lack or are extremely low in any one of the essential amino acids are called “incomplete protein.” Most meats and dairy products are complete-protein foods, while most vegetables and fruits are incomplete-protein foods. To obtain a complete-protein meal from incomplete proteins, one must combine foods carefully so that those weak in an essential amino acid will be balanced by those adequate in the same amino acid.

The minimum daily protein requirement, the smallest amino acid intake that can maintain optimum growth and good health in man, is difficult to determine. Protein requirements differ according to the nutritional status, body size, and activity of the individual. To figure out individual protein requirements, simply divide bodyweight by 2, and the result will indicate the approximate number of grams of protein required each day.

Protein deficiency may lead to abnormalities of growth and tissue development. The hair, nails, and skin especially will be affected, and muscle tone will be poor. A child whose diet is deficient in protein may not attain his potential physical stature. Extreme protein deficiency in children results in kwashiorkor, a disease characterized by stunted mental and physical growth, loss of hair pigment, and swelling of the joints. It is often fatal. In adults, protein deficiency may result in lack of vigor and stamina, mental depression, weakness, poor resistance to infection, impaired healing of wounds, and slow recovery from disease.

Loss of body protein occurs as a result of particular bodily stresses, such as surgery, hemorrhage, wounds, or prolonged illness. At times of stress, it

is necessary to consume extra protein in order to rebuild or replace used or worn-out tissues. However, excessive intake of protein may cause fluid imbalance.

Exercise 1. Find in the text English equivalents to the following Russian word combinations:

главный источник строительного материала для ...; регулировать водный баланс в организме; основные жизненные функции; когда жиры и углеводы присутствуют в достаточном количестве в рационе; все эти аминокислоты за исключением восьми; полностью прекратиться; вычислить индивидуальные потребности в ...; слабая устойчивость к ...; происходить в результате.

Exercise 2. Agree or disagree with the following statements:

1. Protein is one of the most important elements for the maintenance of good health and vitality.
2. Enzymes, substances necessary for basic life functions are formed from protein.
3. The body requires approximately twelve amino acids in a specific pattern to make human protein.
4. Most meats and dairy products are incomplete-protein foods.
5. The smallest amino acid intake that can maintain optimum growth and good health in man is easy to determine.
6. To figure out individual protein requirements simply divide bodyweight by 3, and the result will indicate the approximate number of grams of protein required each day.
7. Protein deficiency may lead to abnormalities of growth and tissue development.
8. Excessive intake of protein may cause fluid imbalance.

Exercise 3. Answer the following questions:

1. Is protein the major source of building material for muscles, blood, skin, hair, nails, and internal organs?
2. What is protein needed for?
3. What happens to excess protein that is not used for building tissue or energy?
4. From what units are proteins constructed?
5. What is necessary for proper synthesis of protein in the body?
6. What must be done to obtain a complete-protein meal from incomplete proteins?
7. What may extreme protein deficiency in children result in? Can this disease be fatal?
8. What may protein deficiency in adults lead to?

9. Why does loss of body protein occur?

JUNK FOOD

Read and memorize the words and word combinations.

1.	junk <i>n.</i>	- рухлядь;
2.	junk food	- неполноценная пища;
3.	announce <i>v.</i>	- заявлять, объявлять;
4.	signify <i>v.</i>	- выражать, предвещать, означать;
5.	alarming <i>a.</i>	- тревожный;
6.	gain benefits	- извлекать пользу;
7.	a serving <i>n.</i>	- порция;
8.	cereals <i>n.</i>	- зерновые, злаки;
9.	a snack <i>n.</i>	- закуска, перекус;
10.	refined sugar	- сахар-рафинад;
11.	plain yoghurt	- йогурт без добавок;
12.	predict <i>v.</i>	- предсказать;
13.	glowing <i>a.</i>	- светящийся.

Read the text and do exercises that follow it.

JUNK FOOD

In today's fast-moving world, people have less and less time to spend eating, let alone cooking. It is probably for this reason that junk food has become so popular, and there's no doubt that it's here to stay. In fact, it seems that you simply can't get away from it. One British hotel group recently announced that guests are able to order fast food through room service, a move which is seen by many as signifying a new era in the couch potato lifestyle. So what exactly is junk food?

Basically, it is anything that is high in calories but lacking in nutrition. Hamburgers, crisps, chocolate bars and hot dogs fall into this category. Pizzas, although they can have vegetables and cheese toppings, are also included into this category.

Obviously, a diet of junk food is not the best thing for your health, particularly as it is high in saturated fat. In 1993, the Journal of the National Cancer Institute reported this type of fat to be associated with a greater risk of cancer.

Apart from the risk of cancer, another side effect of consuming highly fattening junk food is that you are likely to gain weight. This is especially true

because you tend to eat more, as junk food is less satisfying and lower in vital nutrients than healthier food.

The best advice, then, for those who cannot live without their hamburgers or chocolate bars, is to limit the amount of junk food they eat. A little now and then will probably do no harm. But why have our eating habits changed? “It is lack of time and loss of tradition” says one expert. He explains that people are too busy today to cook and eat proper meals, so they grab whatever is available – and that is usually junk food. Also, the style of life represented on TV, especially in the music videos, is fast. Young people pick up the idea that speed means excitement, whereas anything traditional is slow and boring. As a result, they turn down traditional food and go for junk food instead.

Another alarming thing about people’s lifestyle today is that while the amount of junk food we eat has increased, the amount of exercise we do has actually decreased. Exercise plays an important part in keeping the body fit and healthy; it helps to control our weight and, if taken regularly, can also decrease our chances of having a heart attack in later life. What is more, we don’t have to exercise much to gain visible benefits. Doctors say that twenty minutes’ exercise three times a week is all that is necessary.

What we really need nowadays is to turn ourselves towards a well-balanced healthy diet. That is a diet that contains daily servings from each of the basic food groups: meat, vegetable and fruit, milk, bread and cereals. There is no doubt that food tastes and preferences are established early in life. No one is born a «sugar freak» or a salt craver. An incredible statistic is that between 30 and 50 % of all the calories eaten each day are consumed in the form of between-meal snacks. Unfortunately, the usual between-meal foods are low in nutritive value and too high in calories and refined sugar. Some excellent snacks that should always be available are plain-yoghurt, carrots, pieces of apple, cheese and natural fruit juice. Eating yoghurt as a snack food is far healthier and more nutritionally sound than eating so-called junk food, which is less nutritious and too high in sugar and calories. Salted peanuts seem to be the least popular snacks today.

Even though people nowadays are actually far more aware of the importance of exercise and a healthy diet than they were a few years ago, the new unhealthy way of life is surprisingly popular. This is illustrated by the statistics gathered by researchers over the past two decades.

Somebody has once said that we are what we eat. For instance, Italians, who tend to eat lots of fresh fruit and vegetables that contain vitamin C and E, have low levels of heart attacks. Scots, however, tend to have a diet that is high in animal fat and low in fiber. Heart disease is a widespread problem in Scotland.

Recent research has shown that young French people, who prefer burgers and chips to rich gourmet dishes, tend to become overweight. Weight gained in adolescence is extremely hard to lose in later life, so researchers are predicting

that new French generation are not going to be admired for their slim figures as French have traditionally been.

Researchers suggest that new generation will be much more likely to suffer from heart and liver diseases. What can't be emphasized enough is the fact that a balanced diet and regular exercise bring significant benefits. You can gain anything from glowing skin to an all-round feeling of good health. One way or another, the vast majority of people seem to be missing out on this, due mainly to the pressure of modern life.

Ironically, if they were to make time to exercise and improve their eating habits, they would probably find that they were far better equipped to deal with their stressful lifestyle than they are now.

Exercise 1. Find English equivalents to the following words and word combination in the text:

избавляться; предвещать новую эру; плитка шоколада; недоставать питательной ценности; с высоким содержанием насыщенных жиров; быть связанным с повышенным риском; побочный эффект потребления чрезмерно жирной пищи; набирать вес; причинять вред; хватать все, что попадет под руку; стиль жизни, представленный на телевидении; помешанный на сладком; любитель соленой пищи; перекусы между основными приемами пищи; здоровая еда с точки зрения питательной ценности; приносить значительную пользу; из-за прессинга современной жизни; быть лучше вооруженным; справляться с чем-то.

Exercise 2. Complete the sentences using information from the text.

1. Junk food has become so popular today because ...
2. Such products as ... fall into the category of junk food.
3. Junk food isn't the best thing for your health because ...
4. Consuming junk food, you tend to eat more because ...
5. People grab everything whatever is available and eat it because ...
6. Young people consider speed to be ... and everything traditional is ...
7. Regular physical exercises help ...
8. In calories between-meal snacks occupy about ...
9. Those who eat lot of fruit and vegetables are less likely to suffer from heart problems because ...
10. Researchers predict that French people won't be admired for ...
11. The more we exercise and look after our diet the better we'll be equipped to deal with ...

Exercise 3. Agree or disagree with the following statements:

1. Nowadays people spend far more time cooking themselves.
2. Junk food will very soon become unpopular.
3. Junk food is anything which is characterized by high nutritional value.
4. Pizza isn't included into the category of junk food.
5. Junk food is reported to be associated with a greater risk of cancer.
6. People who consume junk food are less likely to gain extra weight.
7. People eat junk food because they are busy for cooking themselves.
8. Popularity of junk food is greatly provoked by TV, which advertises this life style.
9. We must exercise much to gain visible benefits.
10. Our food preferences are established early in life.
11. Italians have low levels of heart attacks because they eat food rich in animal fat.
12. It isn't difficult to lose extra weight gained in adolescence.
13. Eating a well-balanced healthy diet you'll gain such benefits as a glowing skin and all-round feeling of good health.
14. If you changed eating habits and exercised more you would be able to deal with stressful lifestyle.

Exercise 4. Answer the following questions:

1. Why has junk food become so popular today?
2. What signifies a new era in the couch potato lifestyle?
3. What is junk food?
4. How does junk food affect our health?
5. What lifestyle is represented today by TV? Is it good from the point of our health?
6. Who consumes junk food more often?
7. What is said about physical activity and diet habits by doctors?
8. What is a well-balanced diet?
9. When are food tastes and preferences established?
10. How can you explain the statement «we are what we eat»?
11. What facts concerning diet habits are illustrated by the recent statistics?
12. What benefits are brought by a balanced diet and regular exercises?

SOME MORE FACTS ABOUT COFFEE

Read and memorize the words and word combinations.

1.	shepherd <i>n.</i>	- пастух;
2.	herd <i>n.</i>	- стадо, толпа;
3.	gnaw [no:] away <i>v.</i>	- грызть, изгрызать;
4.	indulgence <i>n.</i>	- потакание, потворство своим прихотям;
5.	endure <i>v.</i>	- выносить, терпеть, переносить;
6.	emerge <i>v.</i>	- всплывать, появляться, возникать;
7.	commodity <i>n.</i>	- товар, предмет потребления;
8.	moderate <i>a.</i>	- умеренный, средний;
9.	abstinence <i>n.</i>	- воздержание, умеренность;
10.	agitation <i>n.</i>	- волнение, агитация;
11.	induce <i>v.</i>	- убеждать, воздействовать, вызывать, стимулировать;
12.	benign [bɪˈnaɪn] <i>a.</i>	- доброкачественный, благотворный;
13.	withdrawal [wɪðˈdrɔ:əl] <i>n.</i>	- синдром отмены, абстиненция;
14.	alert <i>a.</i>	- живой, проворный;
15.	sinner <i>n.</i>	- грешник;
16.	emerge <i>v.</i>	- появляться;
17.	addictive <i>a.</i>	- вызывающей привыкание;
18.	commodities <i>n.</i>	- товар;
19.	sacred <i>a.</i>	- священный, святой.

Read the text and do exercises that follow it.

SOME MORE FACTS ABOUT COFFEE

Long ago it is said a lone shepherd and his flock came across a strange and mysterious plant growing upon secluded and forgotten hillside. Before he could stop them some of herd began to gnaw away at this unusual berry. After about fifteen minutes or so the herder started to notice that his sheep were behaving in an odd manner. Not only were they unusually alert but they also appeared to be extremely hyperactive. Now being a little weary and extremely tired the shepherd decided to try the berries and see if the end results would be the same for him as they had been for his flock. To his pleasant surprise the shepherd began to feel wide awake and he became very alert. After a few hours had

passed along came a wandering monk who, after being informed of the plants amazing qualities proceeded to scold the poor shepherd and lecture him on his foolish indulgence. After he had finished telling the shepherd just what a sinner he had had been the monk set upon his journey but not before he had added a little something to his backpack and supplies.

Back at the monastery the monk decided to try this new substance. Soon the endless hours of praying were endured with the greatest of ease. Coffee, the drink had been revealed to the world. Its widespread use then took a grip in the Ethiopian lands before then migrating on to the Arabian outlands. Here it was to be held for many years as a sacred substance but was eventually to be unlawfully exported by a merchant called Baba Budan. Words of its qualities were soon to spread and within a few years coffee was to emerge as one of the most valued commodities of all time. Now would you believe that each year we drink amazing four billion cups and there are those among us who would cry at the thought of starting their day without coffee?

Although coffee is mainly known as a sleep suppressant there are those who consider coffee to have many health benefits. It is thought that people who suffer from asthma and partake of the beverage have at least 25 % less symptoms which may be due to a substance in coffee called theophylline. This is known as a bronchodilator and quite simply it is thought to help those who suffer with the disease to breathe with a little more ease. Drinking coffee on a daily basis is considered to lower your chances of developing colon cancer by about 25%. This may be due the fact that coffee helps to keep your regular.

So as you can see coffee seems to be relatively harmless when taken in moderate doses – two to four average-sized cups of coffee a day. At the same time coffee or to be more exact, caffeine is rather addictive and the body adapts to its presence. Sudden abstinence after long use or cutting back from a high to a low dose causes a characteristic withdrawal headache, curable only by taking more coffee. An overdose of coffee may produce a reaction indistinguishable from an anxiety attack and people complain of dizziness, agitation, restlessness, recurring headaches, intestinal discomfort and sleep difficulties. Large doses of coffee can also cause abnormal heartbeats, hypertension and increased blood cholesterol and are believed to cause heart attacks in people whose hearts were already damaged by degenerative disease.

Caffeine has effects on nutrition, too. The caffeine in a few cups of coffee can double the excretion of calcium and magnesium, though the amounts lost per day are rather small, but over years they become significant. Caffeine also may induce benign breast disease and worsen premenstrual symptoms in women who overuse it.

But coffee is still rather delicious and charming beverage and your rational consumption of coffee won't do any harm but make your life better.

Exercise 1. Find the equivalent to the following combinations of words:

наткаться на что-то; удаленный, уединенный; вести себя странно; сна не было ни в одном глазу; бранить, ругать кого-то; бесконечные часы молитв переносились гораздо легче; священное вещество; самый ценный товар; представлять много пользы для здоровья; известно, что кофе расширяет бронхи и помогает легче дышать; уменьшать риск; относительно безвредно; кофеин вызывает быстрое привыкание; воздержание от кофе вызывает абстинентные головные боли; жаловаться на головокружение и беспокойство; удваивать выведение кальция и магния из организма; употреблять сверх меры; вкусный; разумное потребление.

Exercise 2. Complete the sentences using the facts given in the text.

1. The first one who discovered a mysterious plant, later called coffee, was...
2. After the sheep had eaten these strange berries, the herder started to notice that his sheep...
3. The shepherd told about plants amazing qualities to ...
4. Soon the monks began using coffee during the endless hours of praying which ...
5. Widespread use of coffee took a grip in ... and then migrated on to ...
6. Coffee is considered to have many health benefits such as ...
7. If one drinks coffee on a daily basis can lower the chances of ...
8. Coffee is relatively harmless if...
9. The body adapts to the presence of coffee easily because ...
10. Sudden abstinence of coffee or cutting its doses may cause ...
11. Large doses of coffee can cause...
12. Coffee can double the excretion of ...
13. Coffee is rather harmful for female organism as ...
14. Consumption of coffee won't do any harm on condition that ...

Exercise 3. Answer the following questions:

1. Who was the first to come across a strange and mysterious plant growing upon secluded and forgotten hillside, later called coffee?
2. The sheep, which had eaten this plant, were behaving in an odd manner, weren't they? What was their behavior like?
3. Did the shepherd himself try these berries? What was the effect of it?
4. Whom did the shepherd tell about this mysterious plant?
5. Did the monks start to use coffee? What for?
6. To which countries did the use of coffee spread?
7. Coffee is known as a perfect sleep suppressant, isn't it? What other health benefits has coffee?
8. What links has coffee with colon cancer?

9. Under what circumstances does coffee produce no harmful effects to the human health?
10. Can a man become coffee-addictive? Why?
11. What happens when a person consuming great amounts of coffee will cut its consumption?
12. What side-effects may coffee overdose cause?
13. Can large doses of coffee seriously damage our health? Give some examples.
14. What important elements are excreted from our organism with coffee?
15. Why is coffee overdose considered to be dangerous for women?

SOME SELECTED VITAMINS AND MINERALS

Study the following words.

1.	pellagra [pe'laegrə] <i>n.</i>	- пеллагра;
2.	flaking <i>n.</i>	- шелушение, сухость;
3.	aberration <i>n.</i>	- помрачение ума;
4.	scurvy <i>n.</i>	- цинга;
5.	nocturnal cramping	- ночные судороги;
6.	conjunction <i>n.</i>	- союз;
7.	enhance ['inha:ns] <i>v.</i>	- увеличивать;
8.	calves (от "calf") <i>n.</i>	- телята;
9.	uptake <i>n.</i>	- поглощение;
10.	maintenance <i>n.</i>	- поддержание, сохранение;
11.	supplement <i>n.</i>	- добавка (к пище);
12.	arsenic <i>n., a</i>	- мышьяк, мышьяковый.

Read the text and do exercises that follow it.

SOME SELECTED VITAMINS AND MINERALS

A major function of vitamins, especially the B family of vitamins, is to act as coenzymes. Coenzymes are generally small molecules working in conjunction with enzymes to enhance the enzymes' activity. *Niacin*, in particular, is an extremely important coenzyme in energy transfer during glucose and fat metabolism. The synthesis of niacin requires tryptophan, thus making tryptophan an essential amino acid. A diet deficient in tryptophan may lead to niacin deficiency. Such a deficiency causes *pellagra*, a condition involving a darkening and flaking of the skin as well as behavioral aberrations.

Vitamin C, also called ascorbic acid, must be supplied in the diet. Although other animals can synthesize Vitamin C from glucose, humans cannot because

we lack an enzyme necessary to convert glucose to ascorbic acid. Citrus fruits and green vegetables are the common sources of vitamin C. Ascorbic acid is necessary to prevent *scurvy*, a disease in which collagen, an important structural protein, is broken down. The link between vitamin C and scurvy was discovered over 200 years ago when it was found that feeding British sailors limes or lime juice on long sea voyages prevented scurvy. It also led to British sailors being called “limeys”. Vitamin C is also necessary for the uptake, use, and storage of iron, important in the prevention of anemia. We will look at this aspect shortly.

Vitamin E is important in the maintenance of cell membranes and as protection against high concentrations of oxygen, as in the lungs. In general, vitamin E is so widespread in foods that it is difficult to create a vitamin E-deficient diet. People who eat very little fat may need vitamin E supplements. Vitamin E deficiency in humans has been linked with nocturnal cramping in the calves and fibrocystic breast disease.

An adequate supply of minerals is also essential to the body. Not nearly as abundant as carbon, nitrogen, hydrogen, or oxygen, these seven elements are nevertheless vital for good health. Also called macrominerals, they play very important roles in metabolism. However, there are other minerals, the microminerals, that are also essential, but occur in the body in lesser amounts than the macrominerals. The recognized microminerals include iron, manganese, copper, and iodine. Other elements are present in the body at even lower concentration. These include zinc (for basal metabolism), fluorine (in bones and teeth), and cobalt (one atom per vitamin B₁₂ molecule). Even arsenic, which is generally classified as toxic, is needed in trace amounts.

These various essential elements are identified in the skeleton. The metals exist in the body as cations, for example, Ca²⁺ (calcium), K⁺ (potassium), Fe²⁺ (iron), and Na²⁺ (sodium). The non-metals typically are present as anions, thus chlorine is found as Cl⁻ and phosphorus appears in the phosphate ion, PO₄³⁻.

Exercise 1. Give English equivalents to the following words:

усиливать активность, жировой обмен, потемнение и шелушение кожи, расстройства поведения, недостаток (нехватка) чего-л., разрушение коллагена, связь м/у цингой усвоение и сохранение.

Exercise 2. Mark the statements: “True” (T) or “False” (F). Then, correct the false statements.

1. Coenzymes are molecules working apart of enzymes and don't influence on their activity....
2. Pellagra is usually caused by niacin deficiency....
3. Humans are able to synthesize vitamin C from glucose....
4. Vitamin C was discovered 400 years ago....

5. Vitamin C is necessary for use and storage of iron....
6. Vitamin E is important in the maintenance of cell membranes and protect lungs from the high concentration of nitrogen....
7. Vitamin E deficiency causes nocturnal cramping fibrocystic breast disease....

Exercise 3. Complete the sentences:

1. A major function of vitamins is ...
2. Although animals can synthesize vitamin C from glucose, humans ...
3. The common sources of vitamin C are ...
4. The link between vitamin C and scurvy was discovered ...
5. Vitamin E is important in ...
6. People who eat very little fat may have ...
7. An adequate supply of minerals is also ...
8. These seven elements are vital for good health ...

Exercise 4. Answer the questions:

1. What is the main function of vitamins?
2. What are coenzymes?
3. What causes pellagra?
4. What is vitamin C necessary for?
5. What are the possible effects of vitamin E deficiency?
6. What is the role of minerals?
7. What are micro- and macrominerals?
8. What toxic substance is also needed for our health?
9. Enumerate essential elements identified in the skeleton.

THE VITAMIN C SAGA

Read and memorize the following wordsю

1.	victim [ˈvɪktɪm] n.	- жертва;
2.	siege [saɪdʒ] n.	- осада;
3.	outbreak [ˈaʊtbreɪk]	- вспышка (эпидемии);
4.	recover [rɪˈkʌvə] v.	- выздоравливать, оправляться (from);
5.	link [lɪŋk] v.	- связывать;
6.	vinegar [ˈvɪnɪɡə] n.	- уксус;
7.	mustard [ˈmʌstəd] n.	- горчица;

8.	distemper [dis' tempə] <i>n.</i>	- расстройство здоровья;
9.	guinea-pig ['gɪnɪpɪg] <i>n.</i>	- морская свинка;
10.	lack [læk] <i>v.</i>	- испытывать недостаток, нехватать;
11.	scurvy ['skɜ:vɪ]	- цинга;
12.	elucidate [ɪ'lu:sɪdeɪt] <i>v.</i>	- объяснять, проливать свет;
13.	claim [kleɪm] <i>v.</i>	- утверждать, заявлять;
14.	assessment [ə'sesmənt] <i>n.</i>	- оценка;
15.	prevent [pri'vent] <i>v.</i>	- предотвращать, предохранять;
16.	spot [spɒt] <i>n.</i>	- пятно, пятнышко;
17.	scatter ['skætə] <i>v.</i>	- разбрасывать;
18.	scorbutic [sko:'bjʊtɪk] <i>a., n.</i>	- цинготный; цинготный больной.

Read the text and do exercises that follow it.

THE VITAMIN C SAGA

In 1498, a famous Portuguese explorer *Vasco da Gama* wrote one of the earliest observations on scurvy after his fleet of ships rounded the Cape of Good Hope and docked for a month at the mouth of a river in South Africa. The ship's log records* that "many of our men fell ill here, their feet and hands swelling, and their gums growing over their teeth so that they could not eat." The most striking scurvy symptom is the appearance of purple spots scattered all over the person's body. These symptoms were apparently relieved after da Gama's crew obtained some oranges from a Moorish vessel. They put out to sea once more, and twelve weeks later the sailors redeveloped the same problems. This time about 30 of the 140 crew members died, and only 7 or 8 were healthy enough to navigate each ship. Fortunately, favorable winds blew the vessels towards Mitindy, where they docked and came ashore* for oranges; the sick crewmen believed their earlier cure was from the fruit's magical properties. The fleet eventually returned safely home, but with about half the original crew.

Did da Gama's crew really recognize that oranges (a vitamin C source) prevented scurvy? This point is debatable, since most ships after da Gama did not carry oranges or other citrus fruits, and passengers and crew often fell victims to scurvy. Scorbutic symptoms (that is, the symptoms of scurvy) were not restricted to seafaring vessels* and sailors; land-based scurvy was quite common, although it was many years before physicians realized the two diseases were identical. In 1734, *John Bachstrom* noted that a scurvy epidemic that occurred during a siege of Thorn (Poland) in 1703 was not cured until the townspeople resumed eating fresh vegetables and greens. A similar outbreak

occurred in 1719-20 during a military campaign against the Turks in Hungary. The soldiers did not recover from scurvy until they obtained fresh vegetables.

Though a dietary connection was suspected years before the true cause of scurvy was diagnosed, it was 1747 before any experimental research linked scurvy with certain food deficiencies. *James Lind* (British, 1716-94) isolated a dozen scorbutic sailors and gave pairs of them six different treatments, including (1) cider, (2) elixir vitriol (dilute sulfuric acid), (3) vinegar, (4) seawater, (5) oranges and lemons, and (6) a paste of garlic, mustard seed, balsam, radish root, and gum myrrh. Lind concluded “that oranges and lemons were the most effectual remedies for this distemper at sea,” and that cider was second best.

After Lind left the navy, he published a 400-page book on scurvy in 1753. Nevertheless, it was many years before an antiscorbutic food became a firm requirement on British ships.

The first antiscorbutic fruit the navy used was lemons, but they were soon replaced by limes, apparently on the basis of cost and availability. (Lemons have nearly double the amount of vitamin C.) Soon, the British sailors were called “limeys” because they regularly drank lime juice, which prevented them from becoming a “scurvy lot.”

Shortly thereafter, *Axel Holst* (Norwegian, 1860-1931) fed guinea pigs restricted diets that lacked vitamin C. The animals developed a scurvylike disease. Subsequent studies used guinea pigs to determine which food were antiscorbutic.

In 1918, *S.S. Zilva* (German) began systematic studies; in 1928 he reported that lemon juice appeared to have a high antiscorbutic activity. Later in 1928, *Albert Szent-Györgyi* (Hungarian, 1893-1986) isolated hexuronic acid (vitamin C) from lemon juice; in 1932, *Waugh* and *Kink* determined that this was the specific antiscorbutic agent in lemons. *Norman Haworth* (British, 1883-1950) elucidated hexuronic acid’s structure in 1933, and *Tadeus Reichstein* (Polish, 1897-) synthesized the molecule later that year. Finally, in 1933, *Haworth* and *Szent-Györgyi* changed the name of the compound to ascorbic acid, meaning an antiscorbutic acid. Szent-Györgyi received the 1937 Nobel Prize for his discovery of vitamin C and for studies on respiration.

The research on vitamin C continues today. Recent arguments concern whether vitamin C can prevent or cure cancer or the common cold. The leading advocate of this position was *Linus Pauling* (American, 1901-1994). Pauling, a double Nobel Prize winner in chemistry and peace, recommended massive doses of 10 g/day. Although Pauling was considered one of the leading scientists of the late twentieth century, not all scientists agreed with his assessment of vitamin C; some of them note that Pauling’s claims have not yet been rigorously proven. Some supporting data do exist for using vitamin C as an anticancer agent, since ascorbic acid prevents the formulation of nitrosamines, which are powerful carcinogens. Several studies show that vitamin C protects against human bladder cancer, possibly through nitrosamine prevention. Vitamin C also

appears to inhibit the action of hyaluronidase, an enzyme that enables cancer cells to metastasize and spread the cancer throughout the body.

Many studies show that vitamin C has some antiviral activity and that it stimulates the immune system; either of these actions *might* prevent a cold. One reasonable concern in this matter is the safety of taking such massive doses over prolonged periods; thus, the vitamin C saga continues.

- Notes:**
- * log records – записи в вахтенном журнале;
 - * came ashore – сошли на берег;
 - * seafaring vessels – морские корабли.

Exercise 1. Find in the text English equivalents for the following word combinations:

становиться жертвами цинги; вылечиться от цинги; прежде чем было установлена истинная причина цинги; экспериментальные исследования; наиболее действенные средства; ограниченное питание, в котором отсутствовал витамин С; болезнь, схожая с цингой; получить Нобелевскую премию; может предотвратить или вылечить рак или простуду; использование витамина С в качестве противоракового средства; иметь антивирусную активность; прием массированных доз витамина С продолжительное время.

Exercise 2. Combine the sentences in lists A and B.

A	B
1. John Bachstrom	a) used guinea pigs in his studies
2. James Lind (British)	b) isolated hexuronic acid (vitamin C) from lemon juice
3. Axel Holst (Norwegian)	c) claim vitamin C can prevent or cure cancer or the common cold
4. S.S. Zelva (German)	d) noted that scurvy epidemic (1703) was cured by eating fresh vegetables and greens
5. Albert Szent-Györyi (Hungarian)	e) received the Nobel prize for his discovery of vitamin C and for studies on respiration
6. Norman Haworth (British)	f) synthesized the molecule of hexuronic acid
7. Tadeus Reichstein (Polish)	g) began systematic studies to determine which foods were antiscorbutic
8. Linus Pauling (American)	h) established experimentally connection between diet and scurvy
	i) elucidated hexuronic acid's structure

Key

8c, 7f, 6i, 5b, 4, 3a, 2h, 1d,

Exercise 3. Answer the following questions:

1. Who wrote one of the earliest observations on scurvy?
2. What were the main symptoms of scurvy described by Vasco da Gama?
3. Did Vasco da Gama's crew really recognize that oranges prevented scurvy?
4. Who carried out experimental research on certain food deficiencies?
5. What conclusion did James Lind make?
6. Why British sailors were called "limeys"?
7. Which scientist began systematic studies on food deficiency diseases?
8. Which scientist received the 1937 Nobel Prize for his discovery of vitamin C?
9. Who continued research on vitamin C at the beginning of the 20th century?
10. Recent arguments concern the possibility of using vitamin C for prevention and curing cancer and common cold, don't they?
11. What supporting data exist for using vitamin C as anticancer and antiviral agent?

INTRODUCTION TO PATHOLOGY

Learn the following words.

1.	to derive	- получать, извлекать, происходить;
2.	to emerge	- появляться, возникать;
3.	to bear	- носить, поддерживать;
4.	to confuse	- приводить в замешательство, смущать;
5.	to elicit	- выявлять;
6.	to alter	- изменять;
7.	to affect	- поражать;
8.	lesion	- повреждение;
9.	blot	- пятно;
10.	entire	- полностью, целиком;
11.	to substitute	- снабжать.

Read the text and do exercises that follow it.

INTRODUCTION TO PATHOLOGY

Definition of pathology

The word 'Pathology' is derived from two Greek words — '*pathos*' meaning suffering, and '*logos*' meaning study. Pathology is, thus, scientific study of structure and function of the body in disease; it deals with causes, effects, mechanisms and nature of disease. The knowledge and understanding of pathology is essential, for all would-be doctors as well as general practitioners and specialists since unless they know the causes and mechanisms of disease and understand the language spoken by the pathologist in the form of laboratory reports, they would not be able to institute appropriate treatment or suggest preventive measures to the patient. For the medical student, the discipline of pathology forms a vital bridge between initial learning phase of preclinical sciences and the final phase of clinical subjects.

Pathology over the years was thought as a distinct discipline from other branches — anatomy, medicine and surgery, in that sequence. After having emerged as a laboratory phase of medicine (and surgery), pathology is now not confined to laboratories alone, particularly in fields such as aspiration cytology and haematology which involve cytopathologist and haematologist in laboratory as well as in clinical phase of patient care.

Health and disease

Since pathology is a study of disease, then what is *disease*? In simple language, disease is opposite of health i.e. what is not healthy is disease. But the terms health and disease are difficult to define. *Health* is a condition when the individual is in complete accord with the surroundings, while disease is loss of ease to the body (dis-ease). However, it must be considered that there is a wide range of 'normality' in health e.g. in height, weight, blood and tissue chemical composition etc. The confusion is further compounded by changes in health at cellular level since the cells display wide range of activities within the broad area of health similar to what is seen in diseased cells. In short, health and disease are not absolute but are considered as relative states.

A term commonly confused with disease is *illness*. While disease suggests an entity with a cause, illness is the reaction of the individual to disease in the form of symptoms (complaints of the patient) and physical signs (elicited by the clinician). Not to be ignored are the individual differences in reaction to disease. Though disease and illness are not separable, the study of diseases is done in pathology while the learning of illnesses will be done in wards and clinics.

In addition to disease and illness, there are *syndromes* (meaning 'running together') characterized by combination of symptoms caused by altered physiologic processes.

Terminology in pathology

It is important for a beginner in pathology to be familiar with the language used in pathology:

- Patient is the person affected by disease.
- Lesions are the characteristic changes in tissues and cells produced by disease in an individual or experimental animal.
- Pathologic changes or morphology consists of examination of diseased tissues.

Depending upon the species studied, there are various disciplines of pathology such as human pathology, animal pathology, plant pathology, veterinary pathology, poultry pathology etc.

1. *Flow cytometry*. This is a computerised technique by which the detailed characteristics of individual tumour cells are recognised and quantified and the data can be stored for subsequent comparison too.

2. *Hybridization*. This is a molecular technique by which nucleic acid sequences (cellular/viral DNA and RNA) can be localized by specifically-labelled nucleic acid probe directly in the intact cell {in situ} rather than by DNA extraction. In situ hybridisation may be used for analysis of certain human tumours by the study of oncogenes aside from its use in diagnosis of viral infection.

3. *Molecular diagnostic techniques*. The groups of molecular biologic methods in the tumour diagnostic laboratory are a variety of DNA/RNA-based molecular

techniques in which the DNA/RNA are extracted (compared from in situ above) from the cell and then analyzed.

The molecular methods in tumour diagnosis can be applied in haematologic as well as non-haematologic malignancies by:

- analysis of molecular cytogenetic abnormalities;
- mutational analysis;
- antigen receptor gene rearrangement; and
- by study of oncogenic viruses at molecular level.

4. *DNA microarray analysis of tumours.*

Fluorescent labels are used to code the cDNA synthesized by trigger from mRNA. The conventional DNA probes are substituted by silicon chip which contains the entire range of genes and high resolution scanners are used for the measurement.

Exercise 1. Find English equivalents to the following combinations of words:

в полном соответствии; потеря легкости; природа заболевания; клеточный уровень; реакция человека на болезнь; протекающие одновременно; невооруженным глазом; функциональные проявления болезни; компьютеризированная технология; подробные характеристики; флуоресцентные ярлыки; используются для измерения.

Exercise 2. Decide if the following statements are TRUE or FALSE.

1. The word "Pathology" is derived from two Latin words.
2. The knowledge of pathology is necessary for all for all future doctors.
3. Pathology has involved over the years as a distinct discipline from other branches anatomy, medicine and surgery.
4. Pathology is a study of diseases.
5. Health is a state of a harmony with the world around.
6. Disease and illness are not separable, they both are the subject of pathology.
7. The pathologic changes can be recognized with the naked eye.

Exercise 3. Arrange the sentences logically as they appear in the text.

1. The casual factors responsible for the lesions are included in etiology of disease.
2. The clinical significance of the morphologic and functional changes help to answer what is wrong in the organism.
3. The pathologic changes can be recognized with the naked eye.
4. The functional implications are felt by the patient as symptoms.
5. Pathology is scientific study of structure and function of the body in disease.
6. A term commonly confused with disease is illness.

7. The term health and disease is difficult to define.

(*Key: 5-7-6-3-1-4-2)

Exercise 4. Answer the questions.

1. Where is the word "pathology" derived from?
2. What is pathology?
3. What is health?
4. What is the definition of disease?
5. What is the difference between illness and disease?
6. What is meant by syndromes?
7. Give the definitions to the following notions: patient, lesion, pathologic changes.
8. What is etiology?
9. What is pathogenesis?
10. What do the clinical significance of morphologic and functional changes as well as the results of other investigations help to understand (define)?
11. What subdivisions of Pathology do you know?

Exercise 5. Express your opinion on the following:

Why is it important for future doctors to gain the knowledge and understanding of pathology?

MALADIES OF THE 21ST CENTURY

Learn the words.

1.	malady	- болезнь;
2.	to witness	- свидетельствовать;
3.	fatigue	- усталость;
4.	ignorance	- невежество, неведение;
5.	to ban	- запрещать;
6.	addictive	- вызывающий привыкание, болезненное пристрастие;
7.	mucus	- слизь;
8.	tar	- деготь, смола;
9.	sore	- нездоровый;

10.	pedestrian	- пешеход;
11.	hangover	- похмелье;
12.	rampant	- сильно распространенный (о пороках, болезнях).

Read the text and do exercises that follow it.

MALADIES OF THE 21ST CENTURY

We entered the 21st century with such maladies as heart and vascular system diseases, environmental diseases, cancer, AIDS (Acquired Immune Deficiency Syndrome). The risk factors causing these diseases are poor environment (especially after Chernobyl disaster), constant stress and bad habits. We witness more and more cases when people suffer from such environmental diseases as food allergies, chronic fatigue syndrome, asthma, thyroid gland. They all have a huge impact on the quality of life, darken our prospects for future. Alcohol, drugs, smoking, AIDS have also become the reality of our life, especially among young and middle-aged people. Today we'll analyze the diseases which have come as a result of people's ignorance and lack of healthy habits.

Smoking

Smoking is very dangerous. Most young people smoke because their friends pressure them to do so. A. At one time this would have been accepted as normal. But in the past 30 years attitudes about smoking have changes. Smoking is now banned in many places so that other people don't have to breathe in smokers' shocking tobacco smoke.

Passive smoking, when you are breathing someone else smoke, can damage your health just like smoking can. Smoking becomes addictive very quickly, and it's one of the hardest habits to break.

Take 1000 young people who smoke 20 cigarettes a day. A quarter of them will die from a disease caused by smoking. That's 250 lives wasted! Only six of those 1000 teenagers will die in road accidents. So what is it in cigarette smoke that is harmful? A chemical called nicotine is a substance that causes addiction. It is a stimulant that increases the pulse rate and a rise in the blood pressure. Cigarette smoke also contains tar – a major factor for causing cancer.

Chronic bronchitis occurs when tar and mucus damage the air sacks in the lungs.

B.

Gases in cigarette smoke increase assure and pulse rate. This to heart disease.

C.

Smokeless tobacco that is chewed rather than smoked, is also harmful, causing mouth sores, damage to teeth and cancer.

If you've ever watched an adult try to give up smoking, you know how hard it can be. It's easier, healthier and cheaper never to start.

Facts about smoking:

- The smell of smoke on your breath and clothes will put people off.
- Someone who smokes 15 cigarettes a day can forget six to nine years of their life.
- You're burning a great deal of money. In many countries cigarettes are heavily taxed.
- Your skin will wrinkle faster and deeper than that of a non-smoker.
- Females who smoke heavily may wrinkle like a woman 20 years older in age.

Alcohol

Another poison of many young people is alcohol. **D**. It can make you sick, and you can become addicted to it. It's a very common form of drug abuse among teenagers. Don't let anyone at a party pressure you into drinking if you don't want to, especially if you're legally under age.

For years we have been told not to drive after we have drunk alcohol, which weakens our sense and clouds our judgment. **E**. Young people, who are drunk are less likely to wear their seat belts, and are less experienced when a problem occurs. The alcohol makes them think they are brilliant drivers and can take risks without getting hurt. **F**. If they do have an accident, the alcohol in their body will make treatment of an injury more difficult.

Alcohol drinks are made up chiefly of water and ethanol, which is an alcohol produced by fermenting fruits, vegetables or grain. **G**. Wine is stronger, and spirits are about half ethanol and half water.

Alcohol is a drug. In fact, it is a mild poison. It is absorbed quickly into the bloodstream, within 4 or 10 minutes of being drunk. Absorption is slower if there's food in the stomach. Once inside the body it passes through the bloodstream to the liver, where poisons are digested.

However, the liver can only process 28 grams of pure, alcohol each hour.

This is a small amount – just over half a glass of beer. Anything else you drink is pumped round the body while it waits its turn to enter the liver.

When alcohol reaches your brain, you may immediately feel more relaxed and light-hearted. **H**. But after two or three drinks, your actions are clumsy and your speech is slurred. If you over-drink, you might suffer from double vision and loss of balance, even fall unconscious, hangover.

Drugs

In facts, all medicines are drugs. You take drugs for your headache or your asthma. But you need to remember that not all drugs are medicines. Alcohol is a drug, and nicotine is a drug. There are many drugs that do you no good at all.

There's nothing wrong with medicinal drugs if they're used properly. The trouble is, some people use them wrongly and make themselves ill. Most of the drugs

are illegal; but some are ordinary medical substances that people use in the wrong way.

I. Young people are often introduced to drug taking by their friends.

Many users take drugs to escape from a life that may seem too hard to bear. Drugs may seem the only answer, but they are no answer at all. They simply make the problem worse.

Depending on the type and strength of the drug, all drug-abusers are in danger of developing side effects. Drugs can bring on confusion and frightening hallucinations and cause unbalanced emotions or more serious mental disorders.

First-time heroin users are sometimes violently sick. Cocaine, even in small amounts, can cause sudden death in some young people, due to heartbeat irregularities. Children born to drug-addicted parents can be badly affected.

Regular users may become constipated and girls can miss their periods. Some drugs can slow, even stop the breathing process. J.

People who start taking drugs are unlikely to do so for long without being found out. Symptoms of even light drug use are drowsiness, moodiness, loss of appetite and, almost inevitably, a high level of deceit.

First there's the evidence to hide, but second, drugs are expensive and few young people are able to find the money they need from their allowance alone. Almost inevitably, needing money to pay for drugs leads to crime.

AIDS

AIDS is a sickness that attacks the body's natural system against disease. AIDS itself doesn't kill, but because the body's defense system is damaged, the patient has a reduced ability to fight off many other diseases, including flu or the common cold.

It has been reported that about 10 million people worldwide may have been infected by the virus that causes AIDS. It is estimated that about 350 thousand people have the disease and that another million (!) may get it within the next five years. Africa and South America are the continents where AIDS is most rampant, although in the States alone about 50,000 people have already died of AIDS.

K. We know that AIDS is caused by a virus that invades healthy cells, including the white blood cells that are part of our defense system. The virus takes control of the healthy cells genetic material and forces the cell to make a copy of the virus. The cell then dies and the multiplied virus moves on to invade and kill other healthy cells. The AIDS virus can be passed on sexually or by sharing needles used to inject drugs. It also can be passed in blood products or from a pregnant woman with AIDS to her baby.

L. One cannot get AIDS by working with someone who's got it, or by going to the same school, or by touching objects belonging to or touched by an infected person. Nobody caring for an AIDS patient has developed AIDS and, since there is no cure for it at present, be as helpful and understanding as possible to those suffering from this terrible disease.

Exercise 1. Find English equivalents to the following combinations of words:

постоянный стресс; отсутствие здоровых привычек; принуждать делать что-то; считалось нормальным; тяжелейшая привычка, которую трудно бросить; злоупотребление сильнодействующими веществами; без повреждений; путанная, бессвязная речь; нет ничего плохого в лекарствах; внезапная смерть; вторгается в здоровые клетки; генетический материал здоровых клеток; передается половым путем.

Exercise 2. Some sentences have been removed from the text. Choose from the sentences (1-12) the one which fits each gap (A-L). The first sentence has been done for you.

1. If someone overdoses accidentally they may become unconscious or even die.
2. They may be copying their parents, who smoke, or other adults they respect.
3. So far there is no cure for AIDS.
4. You may feel you can do crazy things.
5. Many stories about the spread of AIDS is false.
6. The sufferer has a bad cough which is worse in the mornings, and may get breathless easily.
7. Beer is about one part ethanol to 20 parts water.
8. Smokers as twice as non-smokers are likely to have heart trouble.
9. But, more importantly, they become a risk to other drivers and pedestrians – potential killers.
10. People take drugs because they make them feel better.
11. And yet people still do.
12. Remember, alcohol is a drug.

Keys: 1-J, 2-A, 3-K, 4-H, 5-L, 6-B, 7-J,
8-C, 9-F, 10-I, 11-E, 12-D.

Exercise 3. Decide if the sentences below are TRUE or FALSE:

1. Modern diseases are caused mostly by people's ignorance and lack of healthy habits.
2. Passive smoking is less dangerous than "active" one.
3. A major factor for causing cancer, tar, is contained in cigarette smoke.
4. Alcohol, actually, isn't a drug.
5. People become clumsy after two-three drinks only.
6. Many users take drugs to escape from life that may seem too hard to bear.
7. First-time heroin users never feel sick.
8. AIDS itself doesn't kill.

9. The virus takes control of the healthy cells genetic material to make a copy of a virus.
10. All stories about the spread of AIDS are true.

Exercise 4. Answer the questions.

1. What are the reasons for smoking?
2. What are the harmful consequences of smoking?
3. What is the life-span of smokers?
4. What are the dangers caused by alcohol?
5. What is the effect of drugs on a human being?
6. What social problems do the drugs cause?
7. What does AIDS attack?
8. Does AIDS kill people?
9. Does having a virus mean the same as being ill? Is it curable?
10. How is it usually transferred?

Exercise 5. Discuss the text with your group mates. Express your opinion. Would you befriend a person infected with AIDS?

HISTORY OF AIDS

Read and memorize the words.

1.	evolve [i'volv] v.	- развиваться, эволюционировать;
2.	simian ['sɪmiən] adj.	- зоол. обезьяний; обезьяноподобный;
3.	crowding ['kraʊdɪŋ] n.	- давка, толкотня; скученность (населения);
4.	unemployment ['ʌnɪm'plɔɪmənt] n.	- безработица;
5.	bring [brɪŋ] about v.	- вызывать, быть причиной;
6.	permissiveness [pə(:)'mɪsɪvnis] n.	- вседозволенность; терпимость, снисходительность к распушенности, аморальности и т.п.;
7.	otherwise ['ʌðəwaɪz] adv.	- в других отношениях, в остальном;
8.	reverse transcriptase	- транскриптаза обратная;
9.	opportunistic [opə'tju:'nɪstɪk] adj.	- условно-патогенный

		(о микроорганизмах); относящийся к заболеванию, вызванному условно- патогенными микроорганизмами;
10.	decline [dɪˈklaɪn] n.	- спад; понижение.

Read the text and do exercises that follow it.

HISTORY OF AIDS

Origin and spread of HIV. Scientists are not certain how, when, or where the AIDS virus evolved and first infected human beings. Researchers have shown that HIV-1 and HIV-2 are more closely related to simian immunodeficiency viruses, which infect monkeys, than to each other. Thus, it has been suggested that HIV evolved from viruses that originally infected monkeys in Africa and was somehow transmitted to people. One argument against this theory is that HIV has only been found in human beings. It never has been isolated from any wild monkey or other animal species.

Scientists believe that HIV infection spread after significant social changes took place in Africa and the industrial nations during the 1960's and 1970's. In Africa, large numbers of people moved from rural areas to cities, resulting in crowding, unemployment, and prostitution. These conditions brought about an increase in cases of sexually transmitted diseases, including AIDS. Factors that contributed to the spread of the HIV virus in industrial nations included increased sexual permissiveness and increased use of illegal drugs.

AIDS was first identified as a "new" disease by doctors in Los Angeles and New York City in 1980 and 1981. The doctors recognized the condition as something new because all the patients were otherwise healthy, young homosexual men suffering from rare forms of cancer and pneumonia. The name *AIDS* was adopted in 1982. Scientists soon determined that AIDS occurred when the immune system became damaged, and that the agent that caused the damage was spread through sexual contact, shared drug needles, and infected blood transfusions.

After HIV was isolated as the cause of AIDS in 1983 and 1984, researchers developed tests to diagnose HIV infection. These tests have also been used to analyse tissues from several people who had died of undetermined causes in the 1960's and 1970's. Scientists concluded that some of these people had died from AIDS.

Medical progress. Cases of HIV infection reported worldwide have risen dramatically since the early 1980's. During the early 1990's, millions of people

throughout the world had HIV infection or AIDS. Since the discovery of AIDS, scientists have worked to determine how HIV infects and damages human cells. One of the things they learned was that HIV uses an enzyme called *reverse transcriptase* to reproduce itself inside white blood cells. Because human cells normally contain no reverse transcriptase, scientists began to focus on developing drugs that would block this enzyme's action and thus slow the growth of HIV. One such drug is AZT.

Researchers have worked to improve prevention and treatment of the opportunistic infections suffered by AIDS patients. By the early 1990's, scientists were attempting to develop vaccines that would prevent HIV infection or that would "boost" the immune systems of people already infected with the virus.

Efforts to control the spread of AIDS have had some success. For example, among homosexual men HIV infection is spreading more slowly than it did in the early 1980's. This is due entirely to education about prevention and changes in sexual behaviour. HIV blood tests which became available in 1985, caused a gradual decline in transfusion-related cases in the late 1980's. The rate of AIDS in other groups rose, however, during the 1980's and into the 1990's. These groups include people who inject drugs, heterosexual men and women, and the children of HIV-infected women.

Note. AZT means azidothymidine. It is one of the antiviral drugs, which has preserved the health and prolonged the lives of many AIDS patients.

Exercise 1. Find in the text English equivalents to the following Russian word combinations:

значительные изменения в обществе; из сельских местностей в города; венерические болезни; быть принятым; переливание инфицированной крови; неустановленные причины; резко возросли; инфицирует и повреждает клетки человека; для размножения внутри лейкоцитов; не содержат в норме обратной транскриптазы; сосредотачивать усилия на разработке лекарств, которые ...; укреплять иммунную систему.

Exercise 2. Agree or disagree with the following statements:

1. Scientists know for sure how, when, and where the AIDS virus evolved and first infected human beings.
2. AIDS is an extremely serious disorder that results from severe damage to the body's locomotor system.
3. HIV has never been isolated from any wild monkey or other animal species.
4. AIDS was first identified as a "new" disease by doctors in London and Liverpool in 1980 and 1981.
5. The name AIDS was adopted in 1982.

6. HIV is transmitted through air, food, or water, or by insects.
7. One of the things scientists learned was that HIV uses an enzyme called reverse transcriptase to reproduce itself inside red blood cells.
8. Among homosexual men HIV infection is spreading more slowly than it did in the early 1980's due to education about prevention and changes in sexual behaviour.

Exercise 3. Answer the following questions:

1. What conditions brought about an increase in cases of sexually transmitted diseases, including AIDS?
2. Where was AIDS first identified by doctors as a “new” disease?
3. When was HIV isolated as the cause of AIDS?
4. What did HIV use to reproduce itself inside white blood cells?
5. Why did scientists begin to focus on developing drugs that would block reverse transcriptase?
6. Did scientists make any attempts to develop vaccines that would prevent HIV infection or that would “boost” the immune systems of people already infected with the virus?
7. Can you prove that scientists have achieved certain success trying to control the spread of AIDS?
8. What groups of people are at risk of becoming infected with HIV?

DICING WITH DEATH AND LIVING WITH STATISTICS

Read and memorize new words and word combinations from the text.

1.	to dice	- играть в кости;
2.	to be fraught with ...	- наполненным, быть преисполненным;
3.	lead	- свинец, свинцовый;
4.	innocent	- невинный, невиновный, безобидный;
5.	heart-thumping	- душераздирающий;
6.	to race up	- нестись, мчаться;
7.	to pant	- тяжело дышать, пыхтеть, задышаться;
8.	to collapse	- рухнуть, свалиться;
9.	to tremble	- дрожать, трястись;
10.	indigestion	- несварение, диспепсия;

11.	to tap	- стучать, ударять;
12.	to crawl up	- ползать, тащиться;
13.	ancestor	- предок.

Read the text and do exercises that follow it.

DICING WITH DEATH AND LIVING WITH STATISTICS

Every day is fraught with danger. You wake in the morning, rush to the window and take a deep breath. Don't! Hasn't anyone told you about the air being polluted with lead from petrol? Next you go to the bathroom. After touching the lavatory handle, your innocent-looking hands are covered in bacteria, which even a good wash won't entirely remove. You sigh, and get dressed. Good heavens! Didn't you realize that all that nylon won't let your skin breathe?

With a rash beginning to appear on your skin, you make your way to the kitchen for the breakfast. Eating must be good – mustn't it? Of course it is, provide you don't have tea or coffee, which are bad for your heart, or a good old-fashioned English fry-up, which will fill your stomach with cholesterol-building fat.

Depressed – not to mention hungry – you go to clean your teeth. Put down that nylon tooth brush at once! It will ruin your gums. Do you have the courage to weigh yourself? Horrors! You're at least half a stone overweight, which is sure to help send you to an early grave. Hesitating, you make your way to the car, knowing that, according to the statistics, there is rather a good chance that either you or one of your nearest and dearest will be involved in an accident sometime during your life. After a heart-thumping journey, you reach work.

Filled with relief you get into the lift. Get out at once and race up those stairs, unless you want a heart attack tomorrow.

Panting, you reach the office, where you collapse into a chair. The cleaner has just left, leaving an aerosol's delightful aroma floating in the air. You inhale deeply, enjoying the sweet fragrance. Danger! Breathing this substance will ruin your lungs (not to mention our atmosphere, if we are to believe the experts.)

With trembling hands you light a cigarette to calm your nerves. What? How dare you? Your colleague, Ms Brown, comes in, all ready for a busy day – blonde hair and make up in place. Do you think she has heard about the cancer scare concerning hair dyes and eyeliners?

At last lunch time comes. You join your mates in the local for a sandwich. White bread, eh? A low-fiber diet is no good at all. You have "just one more drink", which helps you on your way to liver failure and return to the office. You spend the afternoon fighting a battle with high blood pressure and chronic indigestion and give a sigh of relief as 5.30 arrives.

What a jam on the by-pass tonight. It gets your fingers tapping on the steering wheel, doesn't it? You look in the driving mirror and see a large vein throbbing up and down on your forehead. It throbs even faster as you suddenly remember the article you were reading about strokes.

A nervous wreck, you reach home. You crawl up the path and fall into your wife's protective arms. She won't last much longer than you, of course. She has inhaled a large number of washing powder, quite a few asbestos particles from her hair dries and a great number of chemicals from aerosol sprays.

But do not fear, civilization is here. Are we really that much happier in our modern technological world with all its new-found knowledge than our ancestors who knew nothing of these things? Is it any surprise that there were no analysis or psychiatrists in any century before ours? I'm sure they didn't need any.

Exercise 1. Find in the text the English equivalents to the following words and word combinations:

торопиться, мчаться; глубоко вдыхать; загрязненный свинцом от бензина воздух; удалить полностью; сыпь; жареные блюда; жир, вызывающий отложение холестерина; не говоря уже о том, что ...; травмировать десны; свести в могилу раньше времени; колебаться, сомневаться; приятный аромат, витающий в воздухе; успокоить нервы; вена, пульсирующая на лбу; нервы совсем сдали.

Exercise 2. Agree or disagree with the following statements. Use the following phrases while answering:

I think it's true...; That's quite right...; I don't think it's true...; I am afraid it's wrong.

1. Life in modern world is absolutely safe for men thanks to civilization advances.
2. When you wake in the morning and rush to the window you should take a deep breath which will do a lot of good for your health.
3. You can't entirely remove all bacteria from your hands even after a thorough washing.
4. Modern clothes made of synthetic materials are excellent for our skin.
5. Tea and coffee are the best things for breakfast as they provide us with extra energy and are absolutely safe from the point of our health.
6. Eating fry food may fill your stomach with cholesterol-building fat.
7. Extra weigh can't be a serious harm for your health.

8. According to the statistics, there is almost no chance that either you or one of your relatives will be involved in an accident sometime during life.
9. If you race up the stairs regularly, you can this way prevent a heart attack.
10. An aerosol's delightful aroma floating in the air can cause some problems with you stomach.
11. Hair dyes and eyeliners can't provoke anything dangerous for your heart.
12. Our ancestors weren't happier than we are in our modern technological world with all its new-found knowledge.

Exercise 3. Answer the following questions:

1. In which manner is this story written? To your mind, who is the author of this story? How can you characterize this man?
2. Do you agree that our every day is fraught with danger? Give your arguments?
3. What dangers are waiting for us in our flat in the morning?
4. What things shouldn't be included in your breakfast and why?
5. What clothes are harmful for our skin? And what clothes should be worn?
6. Why can driving a car be dangerous for our health?
7. What are the consequences of using a lift instead of going on foot?
8. What things in the office are able to damage your health?
9. Jams on the road influence our health badly, don't they? Why?
10. Why won't the narrator's wife live longer than he?
11. Has civilization improved or worsened the state of our health?
12. Who are happier - we or our ancestors? Why?

EATING DISORDERS AFFECT BOTH THE MIND AND BODY

Read and memorize new words and word combinations from the text.

1.	to range	- колебаться, располагаться;
2.	withdrawal	- аутизм, абстиненция;
3.	inevitable	- неизбежный, неминуемый;
4.	to sculpt	- ваять, лепить;
5.	self-esteem	- самолюбие, самоуважение;
6.	retardation	- замедление;
7.	brittle	- ломкий, хрупкий;
8.	starvation	- голод, голодание;
9.	irritable	- раздражительный,

		чувствительный;
10.	aloof	- сдержанный, отчужденный;
11.	rigid	- жесткий, негнущийся;
12.	mood swings	- перепады настроения;
13.	embarrassment	- расстройство, нарушение, помеха.

Read the text and do exercises that follow it.

EATING DISORDERS AFFECT BOTH THE MIND AND BODY

Eating disorders are associated with profound mental and physical effects that range from irritability to withdrawal to attempted suicide, and from stomach pain to bone fractures to death.

Many of the abnormalities are typical of those described in the Third World starvation conditions. Many are well known to chronic dieters. Restoring nutrition can bring dramatic physical and mental improvement to both the mind and body.

The current high rates of eating disorders are believed by many to be inevitable result of 60 to 80 million Americans dieting, losing weight, rebounding, and learning to be chronic dieters. Most professionals agree that dieting precedes the onset of an eating disorder. In fact, dieting is suggested as an additional step in the progression from weight dissatisfaction to binge eating. A binge may be the natural result of food deprivation.

While only a minority of people who diet develop eating disorders, some dieters may be more vulnerable than others. Factors that increase vulnerability can be genetic, biological, psychological, personality, socio-cultural and familial. Violence, trauma and childhood sexual abuse are considered to be risk factors. Eating disorders are often associated with alcohol and drug abuse, which can increase the medical and mental complications.

One of the fastest growing eating disorder behaviors in the past years is excessive exercise or exercise addiction to lose weight or sculpt the body. This has become almost epidemic because of the growth in fitness and body shaping. There is a great increase in fitness magazines, fitness spas, and home exercise equipment all with a focus on shape and muscle building.

Among typical signs and symptoms of eating disorders are fatigue, lethargy, weakness, impaired concentration, non-focal abdominal pain, dizziness, faintness, sore muscles, chills, "cold sweat", frequent sore throats, diarrhea and constipation.

One of the most widely spread eating disorders is anorexia nervosa. Patients with anorexia refuse to maintain weight at or above what is minimally normal for their age and height and have an intense fear of weight gain or

becoming fat. They have disturbance in body image, causing undue influence on self-esteem. If female, they have amenorrhea, defined as the absence of at least three consecutive menstrual cycles. This condition can seriously affect all most important bodily systems. A person with anorexia may experience deficiency in potassium, sodium, chloride, calcium, magnesium and high or low bicarbonate. Decreased bone mineral density may lead to fractures, growth retardation, short stature and osteoporosis. Electrolyte imbalance is likely when there is dehydration and purging. In anorexia constipations are rather common as well as vomiting, feelings of fullness and bloating, and abdominal discomfort. Excessive laxatives over time may result in gastrointestinal bleeding and impairment of colonic functioning. Chest pains, arrhythmias, hypertension and edema are commonly present. In patients with anorexia electrocardiogram changes and heart rates lower than 40 beats per minute are common. Muscle weakening is observed accompanied by hair loss, brittle hair and nails, dry skin and cold extremities.

Many of the mental and emotional abnormalities common to anorexia nervosa are directly related to the physical effects of starvation. Patients experience fatigue, apathy, persistent tiredness, faintness. They are depressed and irritable, critical and less tolerant of others; think that weight loss can cause or prevent some life event; deny hunger and eating disorder itself. People with anorexia can't often concentrate; they reveal difficulties with reading comprehension, diminished capacity to think, loss of memory, narrowing of interests and decline in ambition. They isolate themselves from their family and friends, become increasingly aloof and withdrawn.

Another dangerous disease associated with eating behavior is bulimia nervosa. In bulimia nervosa the individual has recurrent episodes of binge eating. An episode includes eating, in a discrete period of time, an amount of food larger than most people eat, and a sense of lack of control over what or how much one is eating during the episode. It includes recurrent inappropriate compensatory behavior to prevent weight gain, such as induced vomiting, misuse of laxatives, diuretics, enemas, or other medications; fasting or excessive exercise. Both binge eating and compensatory behavior occur at least twice a week for three months, on average. This disorder causes numerous disturbances throughout the organism. Gastrointestinal system is mainly affected. Constipation and increased amylase are common. Frequent and severe abdominal pain may lead to rigid abdomen and shock which may result in death. Abuses of laxatives can cause iron deficiency anemia, rectal bleedings and cathartic colon. Dehydration is common along with hypotension, dizziness, weakness, muscle cramps. Aspiration pneumonia is possible in some cases. Besides, cardiovascular, endocrine, muscular- cutaneous and other systems are evidently damaged.

The patients with bulimia nervosa are often of normal weight and may not experience the effects of starvation. However, if they have nutrition deficiencies

due to purging or other behavior, they may have starvation symptoms. When a patient with anorexia becomes bulimic, he experiences symptoms characteristic of both eating disorders. Typically, such emotional effects as anxiety, depression, mood swings, low self-esteem, self-deprecating thoughts, embarrassment and others may be associated with bulimia nervosa. Usually these people feel dependant on others for approval, they feel isolated and that self worth depends greatly on low weight.

Exercise 1. Find in the text the English equivalents to the following words and word combinations:

быть связанным со сложными психическими и физическими действиями; попытка самоубийства; предшествовать началу заболевания; приступы поглощения пищи; жестокость; психические и медицинские осложнения; усталость; вялость; рассеянное внимание; поддерживать вес; постоянный страх набрать в весе; чрезмерное влияние на самолюбие; применение слабительного; запор; ощущения тяжести и вздутия; сопровождающееся потерей волос, ломкими ногтями ...; постоянная усталость; обморочное состояние; злоупотребление слабительных; чувствовать зависимость от стороннего одобрения.

Exercise 2. Agree or disagree with the following statements. Use the following phrases while answering:

I think it's true...; That's quite right...; I don't think it's true...; I'm afraid it's wrong....

1. Eating disorders can't damage human health greatly.
2. Eating disorders are widely spread among chronic dieters and in the so-called Third World starvation conditions.
3. Dieting is typically followed by eating disorders.
4. Some people are more vulnerable to eating disorders than others.
5. Such factors as alcohol and drug abuse can prevent eating disorders.
6. One of the reasons of eating disorders development today is excessive addiction to slim figures and ideal body.
7. There are no common symptoms for those suffering from eating disorders.
8. Patients with anorexia suffer from obesity and have extra weight.
9. A person with anorexia may have excess of such minerals as potassium, sodium and others.
10. Dehydration and purging can cause electrolyte imbalance.
11. Anorexia nervosa can lead to hypotension and higher heart rates.

12. Those who suffer from anorexia believe that weight loss will help to cause or prevent some life events.
13. People suffering from anorexia try to communicate more and spend much time with their families and friends.
14. In bulimia nervosa individuals experience episodes of binge eating.
15. To prevent weight gain individuals take laxatives, diuretics, provoke vomiting, fast and exercise too much.
16. The patients with bulimia may have iron deficiency anemia because of laxatives misuse.
17. When a patient with anorexia becomes bulimic, he experiences symptoms characteristic of both eating disorders.

Exercise 3. Answer the following questions:

1. Are eating disorders associated with profound mental and physical effects?
2. Who is more likely to develop eating disorders?
3. What factors can increase vulnerability to eating disorders?
4. Are eating disorders and weight losing interconnected?
5. What are the most typical symptoms of eating disorders?
6. What is anorexia nervosa?
7. How does anorexia nervosa affect electrolytes?
8. What gastrointestinal disturbances are caused by anorexia nervosa?
9. Anorexia causes numerous changes in the cardiovascular system, doesn't it? What are they?
10. How does anorexia influence mood, behavior, mental and social abilities?
11. What is bulimia nervosa?
12. In which way do people with bulimia prevent weight gain?
13. What are the most typical physical effects of bulimia?
14. Which mental effects do patients with bulimia run across?
15. What social problems can bulimic patients have?

Exercise 4. Imagine the following: one of your friends has been on an exhausting and strict diet for rather a long period of time. Try to persuade her that such things are rather dangerous. Use the facts from the text to make convincing arguments. Use the following phrases to express your opinion:

I believe/consider that ...

Personally I think that ...

From my point of view ...

My view is ...

In my opinion ...

I should say ...

I don't think it's sensible/wise of you ...

I don't approve of it because ...

It's silly of you

TWO AUSTRALIAN SCIENTISTS SNAG THE PRIZE FOR STOMACH ULCER RESEARCH

Read and memorize new words and word combinations from the text.

1.	to pave	- проложить, вымостить;
2.	to reverse	- отменять, пересматривать, поворачивать обратно;
3.	to be ridiculed	- осмеивать, поднимать на смех;
4.	to resolve	- решать, принимать решения;
5.	to fulfill	- выполнить, исполнять, оправдать;
6.	collaborator	- сотрудник;
7.	resistance	- устойчивость, сопротивляемость, невосприимчивость.

Read the text and do exercises that follow it.

TWO AUSTRALIAN SCIENTISTS SNAG THE PRIZE FOR STOMACH ULCER RESEARCH

October, 3, 2005 – the Nobel Prize in Physiology or Medicine was awarded to two Australian scientists for their research on ulcers in the early 1980s. Barry J. Marshall and J. robin Warren have shared this award. Their discovery paved the way for treating peptic ulcers with antibiotics.

Barry J. Marshall is an Australian physician and Professor of Clinical Microbiology at the University of Western Australia. He is well-known for proving that the bacteria *Helicobacter pylori* are the cause of most stomach ulcers, reversing decades of medical doctrine which held that ulcers were caused by stress, spicy foods and too much acid.

Professor Marshall completed his undergraduate medical degree at the University of Western Australia in 1974. He met Robin Warren, a pathologist and researcher who was interested in gastritis, during internal medicine fellowship training at Royal Perth Hospital in 1981. Together, the pair studied the presence of spiral bacteria in association with gastritis. The following year,

1982, they performed the initial culture of *Helicobacter pylori* and developed their hypothesis related to the bacterial cause of peptic ulcer and gastric cancer.

The *Helicobacter pylori* theory was ridiculed by the establishment scientists and doctors, who didn't believe that any bacteria could live in the acidic stomach. To force people to pay attention to this theory, Marshall drank a Petri-dish of the bacteria and soon developed gastritis. The bacteria disappeared after two weeks and the illness resolved spontaneously with the aid of antibiotics. In 1984, while at Fremantle Hospital, Professor Marshall fulfilled Koch's postulates for *Helicobacter pylori* and gastritis. Following that, he did the research at the University of Virginia, USA, before returning to Australia in 1997. He held a Burnet Fellowship at the University of Western Australia from 1998 till 2003.

In 2005, the Karolinska Institute in Stockholm awarded the Nobel Prize in Physiology or Medicine to Dr. Marshall and his long-time collaborator Dr. Warren "for the discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease".

This research and its findings have shown the way for treating ulcers with antibiotics. It has also led to an increased understanding of the connection between chronic infection, inflammation and cancer.

There are some more interesting facts about *Helicobacter pylori*:

- The *H. pylori* bacterium is found only in humans.
- About half of all people have the *H. pylori* in their stomach.
- Infection is more common in developing countries.
- Only about 10% to 15% of the infected people eventually develop ulcers.
- The bacterium may stay in the stomach throughout a person's life.
- Antibiotics can treat this bacterium.
- To avoid antibiotic resistance, *H. pylori* bacterium is usually treated only in people with ulcers.

Exercise 1. Find in the text the English equivalents to the following words and word combinations:

1. урвать приз за ...
2. Нобелевская премия по физиологии и медицине
3. лечение антибиотиками
4. проложить путь для лечения ...
5. вывести гипотезу
6. заставить
7. решаться спонтанно
8. оправдать постулаты
9. избежать невосприимчивости к антибиотикам

Exercise 2. Agree or disagree with the following statements. Use the following phrases while answering:

I think it's true ...; That's absolutely right ...; I don't think it's true ...; I suppose this statement is wrong ...

1. The Nobel Prize has been awarded to two Australian scientists for their research on gastritis.
2. The discovery of Barry J. Marshall and Robin Warren paved the way for treating ulcers with antibiotics.
3. This research has proved that ulcers are caused only by such factors as stress, spicy food and too much acid.
4. In 1985 Warren and Marshall developed their hypothesis related to the bacterial cause of peptic ulcer and gastric ulcer.
5. To make scientific society believe in their theory Marshall drank petri-dish of bacteria and soon he developed ulcer.
6. During their studies Marshall and Warren have proved that bacteria in the stomach can be resolved with the aid of antibiotics.
7. It has been proved that all people have *Helicobacter pylori* bacterium in their stomach.
8. Infection caused by ulcer-causing bacteria develops in adulthood.
9. Antibiotic therapy should be applied in every case when the presence of *Helicobacter pylori* bacteria is medically proved.

Exercise 3. Answer the following questions:

1. What for was the Nobel Prize in Physiology and Medicine awarded to the Australian scientists?
2. Who received the Nobel Prize in 2005?
3. What did Marshall and Warren prove?
4. What hypothesis did Marshall and Warren develop?
5. What factors causing ulcers were the main before Marshall and Warren's research?
6. What was the initial attitude of the scientific society towards this research?
7. What did Marshall undertake to prove his theory in practice?
8. How should ulcers be treated according to this study?
9. How many people have *Helicobacter pylori* in their stomach?
10. When (at what age) do the infectious ulcers usually occur?
11. May *Helicobacter pylori* bacteria stay in a person's stomach without causing an ulcer?
12. In what countries this infection is more common?
13. In what cases is antibiotic treatment of *Helicobacter pylori* usually applied?
14. What facts do you know about ulcers in general? Were you familiar with the information presented in the text?
15. Do you consider this research to be important for medical community? Why?

Exercise 4. Do you know any other Nobel Prize winners in the field of medicine? Prepare a short report on this question.

THE MEDICAL EFFECTS OF TOBACCO CONSUMPTION

Read and memorize new words and word combinations from the text.

1.	to administer	- давать, управлять, наносить;
2.	to accelerate	- ускорять;
3.	threshold level	- предельный уровень;
4.	to trigger	- вызывать, влечь за собой;
5.	triggering	- вызывающий;
6.	consequence	- последствие;
7.	deleterious effects	- вредные действия;
8.	to ameliorate	- улучшать;
9.	flaw	- изъян, недостаток, слабое место;
10.	to skyrocket	- стремительно подниматься;
11.	puff	- затяжка;
12.	to spur	- побуждать, подгонять.

Read the text and do exercises that follow it.

THE MEDICAL EFFECTS OF TOBACCO CONSUMPTION

Discovered in the early 1800s and named nicotianine, the oily essence now called nicotine is the main active ingredient of tobacco. Indeed, researchers recognized in 1942 that smoking dried tobacco leaves was basically a means of administering nicotine, just as smoking opium was a means of obtaining morphine. Nicotine, however, is but a small component of cigarette smoke, which contains more than 4,700 chemical compounds, including 43 cancer-causing substances. Condensates of tobacco smoke suspended in acetone and applied to the skin of mice for long periods cause papillomas or carcinomas at the site. Toxins in cigarette smoke cause breaks in the DNA of cultured human lung cells. In some cases, these carcinogens greatly accelerate the mutation rate in dividing cells, which in turn can lead to tumor formation.

Unfortunately for the smoker, no threshold level of exposure to the toxins has been found. What is clear is that years of cigarette smoking vastly increase the risk of developing several fatal conditions. In addition to being responsible for more than 85 percent of lung cancers, smoking is associated with cancers of

the mouth, pharynx, larynx, esophagus, stomach, pancreas, uterine cervix, kidney, ureter, bladder and colon. Cigarette smoking is thought to cause about 14 percent of all leukemias and 30 percent of new cases of cervical cancer in women. All told, cigarette smoking is responsible for 30 percent of all deaths from cancer and clearly represents the most important preventable cause of cancer in the U.S. today.

Smoking also increases the risk of cardiovascular disease, including stroke, sudden death, heart attack, peripheral vascular disease and aortic aneurysm. Cigarettes caused almost 180,000 deaths from cardiovascular disease in the U.S. in 1990. Components of cigarette smoke damage the inner lining of blood vessels, which can lead to the development of atherosclerosis. The toxins can also stimulate occlusive elements in coronary arteries, thus promoting clots to form and triggering spasms that close off the vessels. In this regard, the smoking of a single cigarette can profoundly disturb blood flow to the heart in patients with existing coronary artery disease.

Furthermore, cigarette smoking is the leading cause of pulmonary illness and death in the U.S. In 1990 smoking caused more than 84,000 deaths from pulmonary disease, mainly resulting from such problems as pneumonia, emphysema, bronchitis and influenza.

Passive smoking — the breathing of side stream smoke (emitted from the burning tobacco between puffs) or of smoke exhaled by the smoker — poses a similar health risk. A 1992 Environmental Protection Agency report emphasized the dangers, especially of side stream smoke. This type of smoke contains more particles of smaller diameter and is therefore more likely to be deposited deep in the lungs. On the basis of this report, the EPA has classified environmental tobacco smoke as a “group A” carcinogen, to which radon, asbestos, arsenic and benzene belong.

Of the estimated 53,000 annual deaths in the U.S. caused by passive smoking, 37,000 come from associated heart disease. A nonsmoker living with a smoker has a 30 percent higher risk of death from ischemic heart disease or myocardial infarction. Lung cancer risk also skyrockets. Any exposure from a spouse who smokes is associated with at least a 30 percent excess risk of lung cancer. Increasing daily amounts and the number of years of smoking significantly heighten the risk. The figure jumps to 80 percent if the spouse has been smoking four packs a day for 20 years. Another recent study points out that 17 percent of the cases of lung cancer among nonsmokers can be attributed to exposure to high levels of tobacco smoke during childhood and adolescence.

The health consequences of smoking among women are of special concern because of the deleterious effect on reproduction. Unfortunately, the fastest-growing segment of smokers in the U.S. is women younger than 23 years. Smoking reduces fertility spurs the rate of spontaneous abortions and stillbirths can cause excessive bleeding during pregnancy and results in lower

birth weights in infants. Moreover, children of smokers do not grow as large or attain the same level of educational achievement as unexposed children.

Smoking is a significant cause of cardiovascular diseases and strokes in women, especially if they also use oral contraceptives. Lung cancer has now surpassed breast cancer as the primary cause of death from cancer among women. In 1993 lung cancer claimed an estimated 56,000 deaths, whereas breast cancer took 46,000 lives.

The elderly also face special harm from smoking. Among those older than 65, the rates of total mortality among current smokers are twice those among people who have never smoked. A 1992 *Time* magazine article noted that three life insurers owned by tobacco companies charge smokers nearly double for term insurance.

Smoking is associated with a variety of other ailments: cataracts, delayed healing of broken bones, periodontal maladies, predisposition to ulcer disease, hypertension, brain hemorrhages and skin wrinkles, to name just a few.

Recently some studies have suggested that cigarette smoking ameliorates symptoms of Alzheimer's disease. It is not surprising that with its powerful effect on the central nervous system, nicotine may influence the condition. Yet methodological flaws plague many of these studies. Moreover, other researchers suggest that smoking may increase the risk of Alzheimer's, in that it accelerates the natural consequences of aging. With its many and potent toxins, cigarettes would in any case be an inappropriate vehicle for delivering nicotine should the compound ever prove valuable in treating Alzheimer's.

There is much to be gained by those who kick the habit. After a year, mortality from heart disease drops halfway back to that of a nonsmoker; by five years, it drops to the rate of nonsmokers. A person's risk of lung cancer is cut in half in five years; by 10 years, it drops almost to the rate of nonsmokers. Such gains make sense, however, only if smokers quit in time, before they show any signs of tobacco's lethal effects.

Exercise 1. Find in the text the English equivalents to the following words and word combinations:

вещества, вызывающие рак; взвешенные в ацетоне; наносить на кожу; вызывать изменения в ДНК; ускорять скорость мутации; привести к образованию опухоли; крайне увеличиться; быть связанным с раком; предотвратимая причина; повреждать внутренние стенки кровеносных сосудов; способствовать образованию сгустков; сильно нарушать кровообращение; оседать глубоко в легких; значительно увеличивать риск; сталкиваться с особым вредом от курения; усиливать естественные последствия курения; бросить курить.

Exercise 2. Complete the sentences using the facts given in the text.

1. Nicotine is a small component of cigarette smoke which contains ...
2. Carcinogens in cigarette smoke accelerate the nutrition rate in dividing cells which can lead to ...
3. Years of cigarette smoking vastly increase the risk of ...
4. Components of cigarette smoke can lead to the development of atherosclerosis as they ...
5. Even smoking of only one cigarette in patients with coronary artery diseases can ...
6. The toxins in cigarette smoke ... that close off blood vessels.
7. Side stream smoke contains more particles of smaller diameter and is therefore ...
8. Consequences of smoking among women have deleterious effects on ...
9. Children of smokers also suffer from it because they ...
10. Among the elderly smoking is associated with a variety of ...
11. Giving up smoking will give us many benefits such as ...

Exercise 3. Agree or disagree with the following statements:

1. Nicotine is the only cancer-causing compound of cigarette smoke.
2. Toxins in cigarette smoke can cause breaks in the DNA thus slowing down the mutation rate in dividing cells.
3. Cigarette smoking is found to be responsible for 30 per cent of all deaths from cancer.
4. Smoking of only one cigarette can distribute blood flow to the heart in patients with coronary diseases.
5. The toxins in cigarette smoke destroy occlusive elements in blood vessels.
6. Passive smokers have the same health risks as those who smoke.
7. Passive smokers are not subjected to “group A” carcinogens: radon, asbestos, arsenic, benzene.
8. Children of smokers grow as large and attain the same level of educational achievements as children, whose parents don’t smoke.

Exercise 4. Answer the following questions:

1. What is the main active ingredient of tobacco?
2. What other components are there in cigarette smoke?
3. Toxins in cigarette smoke can lead to tumor formation, can’t they? How can this fact be explained?
4. What diseases are associated with smoking?
5. In which way do cigarette components affect the cardiovascular system?
6. What cardiovascular diseases are thought to be caused by smoking?

7. Smoking is rather deleterious for the respiratory system, isn't it? Why is it so dangerous?
8. Is passive smoking more or less dangerous than active one?
9. The breathing of side stream smoke has the same health risk, hasn't it? What risk is it?
10. What health problems are passive smokers subjected to?
11. What are the main health consequences of smoking in women?
12. Why smoking is so dangerous in those women who use oral contraceptives?
13. Do the elderly face special harm from smoking? What is it?
14. How can smoking affect Alzheimer's disease?
15. What health benefits have non-smokers over smokers?

Exercise 5. Prepare a short report in which you'll show your attitude to smoking. Use the facts from the text while preparing it. Use the following word combinations:

- I think (suppose, believe, guess) that ...
- If you ask me (my point of view, my opinion) ...
- The way I see this problem ...
- From where I stand ...
- I would say ...
- As far as I'm concerned ...
- In my opinion ...
- It seems to me ...
- I'm convinced that ...
- Personally I consider ...
- I hold the view ...
- My own view of the matter is ...

H5NI FLU VIRUS

Read and memorize new words and word combinations from the text.

1.	avian	- птичий;
2.	pandemic threat	- всеобщая угроза;
3.	waterfowl	- водоплавающая птица;
4.	poultry	- домашняя птица;
5.	manure	- навоз;
6.	to originate	- брать начало, возникать;
7.	multiple	- многочисленный, составной;
8.	to slaughter	- резать, зарезать;
9.	to step up	- подходить, усиливать,

		ПОВЫШАТЬ;
10.	sufficiently	- ДОСТАТОЧНО, ВПОЛНЕ.

Read the text and do exercises that follow it.

H5N1 FLU VIRUS

H5N1 is an avian influenza virus type. The H5N1 flu is what is commonly meant when speaking of “bird flu” or avian influenza. It’s a viral disease that causes illness in many species including human and is a pandemic threat. Experts believe it might mutate into a form that transmits easily from person to person. H5N1 is widespread in the bird population. It is easy for birds to catch avian flu from each other. Most humans known to have become infected had a lot of physical contact with infected birds, or, rarely, an infected relative.

A highly pathogenic variation of H5N1 is currently spreading across the world areas where it is endemic. Migrating waterfowl – wild ducks, geese, swans – carry H5N1 often without becoming sick. Avian flu is also spread through domestic poultry, both through movements of infected birds and poultry products, and the use of infected poultry manure as fertilizer or feed. Humans with H5N1 have typically caught it from chicken, which were in turn infected by other poultry or waterfowl.

Infected birds pass on H5N1 through saliva, nasal secretions and feces. Other birds may pick up the virus through direct contact with these excretions or when they have contact with surfaces contaminated with this material. Because migratory birds are among the carriers of the H5N1 virus it may spread to all parts of the world. Past outbreaks of avian flu have often originated in crowded conditions in southeast and east Asia, where humans, pigs, and poultry live in close quarters. In these conditions a virus can mutate into a form that more easily infects humans.

Since H5N1 is an influenza virus, symptoms similar to those of the common flu, such as fever, cough, sore throat, and sore muscles, can develop in infected humans. However, in more serious cases, pneumonia and respiratory failure can develop and eventually cause death. Patients with H5N1 avian influenza have rarely had conjunctivitis, unlike human cases of infection by the H7 virus. Severe infection from H5N1 caused multiple lung infections, including pus, fever, cough, lung scar tissue, fluid in space surrounding the lungs, enlarged lymph nodes and cavities forming in the lung tissue. Flu virus-induced increases in the level of cytokines are associated with flu symptoms including fever, chills, vomiting and headache. Tissue damage associated with pathogenic flu virus infection can ultimately result in death.

The current method of prevention in animal populations is to destroy infected animals, as well as animals suspected of being infected. In Southeast

Asia, millions of domestic birds have been slaughtered to prevent the spread of the virus.

The probability of a “humanized” form of H5N1 emerging through genetic recombination in the body of a human co-infected with H5N1 and another influenza virus type (a process is called reassortment) could be reduced by influenza vaccination of those at risk for infection by H5N1. It’s not clear at this point whether vaccine production and immunization could be stepped up sufficiently to meet this demand.

Exercise 1. Find in the text the English equivalents to the following words and word combinations:

вызывает болезнь у многих видов...; легко передается от человека к человеку; широко распространен среди птиц; в настоящее время распространяется по миру; использование навоза инфицированной домашней птицы как удобрения или подкормки; люди обычно заражаются от кур; вирус передается со слюной ...; носители вируса; поверхность, загрязненная этими выделениями; вспышка, начало; симптомы схожи с обычным гриппом; вызывают многочисленные легочные инфекции; предположительно инфицированные животные; предотвратить распространение вируса.

Exercise 2. Complete the sentences using the facts given in the text.

1. The H5N1 flu virus is meant when...
2. Experts believe that H5N1 virus may mutate and ...
3. Most people who are infected have had a lot of...
4. Wild ducks, geese, swans can carry H5N1 virus without ...
5. Besides waterfowl, H5N1 virus can be spread ...
6. Infected birds can pass on H5N1 virus through ...
7. In such conditions as... H5N1 virus can infect humans and mutate more easily.
8. Symptoms of H5N1 virus are similar to the common flu and they are ...
9. The current method of this virus is ...
10. The probability of a “humanized” form of the H5N1 virus can be reduced by...

Exercise 3. Answer the following questions:

1. Who can be infected with H5N1 virus?
2. Why is H5N1 virus considered to be a pandemic threat?
3. How can humans catch H5N1 virus?
4. Who carries H5N1 virus without becoming sick?
5. How do infected birds pass this virus on?

6. What are the main symptoms of H5N1 virus?
7. What are the current methods of prevention of this virus?
8. Is influenza vaccination effective against H5N1 virus?

SUPPLEMENTARY TEXTS

I. FROM THE HISTORY OF MEDICINE

HOSPITALS IN THE 17TH CENTURY

A French hospital of the 17th century is described as follows: “In one bed of moderate width lay four, five or six persons beside each other, the feet of one to the head of another, children beside old gray-haired men; indeed, incredible but true, men and women intermingled together. In the same bed lay individuals affected with some infectious disease beside others only slightly unwell. On the same couch, body against body, a woman groaned in the pangs of labour, a nursing infant writhed in convulsions, a typhus patient burned in the delirium of fever, a consumptive coughed his hollow cough and a victim of some disease of the skin tore with furious nails his itching skin ...

The patients lacked the greatest necessities. The most miserable food was doled out to them in insufficient quantities and at irregular intervals. Sometimes food was brought to the patients by the wealthy citizens from the city. For this purpose the door of the hospital stood open day and night. Anyone could enter, anyone brought whatever he wished, and while the sick on one day might be starved, on another day might very likely get immoderately drunk and kill themselves by overloading their stomachs. The building swarmed with vermin, and the air of a morning was so vile in the wards that the attendants only entered with a sponge saturated with vinegar held before their faces.”

About 1/5 of the patients in this hospital died. Recovery from a surgical operation was a rarity. In a hospital in Lyon in 1619, accommodating 549 patients there was only one medical man whose duty was to look after the surgical cases. The stock of surgical instruments possessed by that hospital consisted of just five which included a trephine for opening the skull and a mouth plug for keeping the jaws separated.

OPERATION A HUNDRED YEARS AGO

... Obviously Dr. Mayo did not operate in a well ordered world of men in white. His was “kitchen surgery”. The theatre was usually the patient’s home, the operating-table one from the kitchen or the parlor sofa, or even a door taken off its hinges and laid across two saw-horses. The room was seldom large

enough and Dr. Mayo often refused to permit the presence of anyone but those who were helping him.

Modern men accustomed to strict asepsis in operative routine and surroundings can scarcely credit the stories of pre-antiseptic methods, stories of men who operated in whatever shirt or coat they happened to be wearing, covering it perhaps with a linen duster or an apron still with the stains of previous operations; who stropped their knives on the soles of their shoes before they began and while using one knife held another ready between their teeth; who economized on water that had to be carried in from the well by squeezing the blood from the sponge instead of washing it out; who washed their hands after and not before the operation.

Word of the work of Pasteur and Lister was getting around by 1880 but more as the story of an outlandish fad than as a report of scientific truth. Microbes still belonged to the realm of fantasy, and the concept of cleanliness was still beyond the comprehension of most men.

As for cleanliness of instruments, sponges, towels – well, wasn't it rather silly when the operation itself was so messy. Little is known specially of Dr. Mayo's methods. Being fastidious in dress and person he may have kept his few instruments fairly clean, free at least of dried blood between operations, but they were certainly not sterile. Some of them he carried in a little case or even loose in his vest pocket where he could reach them easily to lance a boil or clip the ragged edges of a minor wound.

He may have removed his long black coat for the task to allow himself greater freedom of movement or to save the garment from soiling. But perhaps he shared that peculiar sense of value which made it a matter of pride for the surgeons to perform an amputation without spotting the whiteness of shirt cuff or front. It is said that Henry J. Bigelow of Boston, one of the nation's ablest surgeons at that time always operated in a dark blue coat with a rose in the buttonhole.

II. FROM THE HISTORY OF BOTANY

GARLIC *GIFT OF NATURE*

Pran Nath Luthra

Hippocrates, reckoned as the father of modern medicine, recommended garlic for many diseases, particularly intestinal disorders. In ancient Egypt, the builders of the pyramids served a compulsory meal of raw garlic to the workers to maintain their health. People used garlic daily when Europe was ravaged by plague. Early immigrants to America discovered that the natives knew about the healing powers of garlic and relied on the plant for afflictions that ranged from snakebite to intestinal disorders. England settlers strapped garlic cloves to the feet of smallpox victims as a cure for the disease. Even today, some Greek, Jew and Chinese grandmothers present a clove of garlic to their infant grandsons as protection against the evil eye.

Botanists describe garlic as a bulbous lilaceous plant bearing the name *Allium sativa*, possessing a pungent taste and a strong smell. Indian mythology has a delightful account about the divine origin of garlic. *Ayurveda* or the Science of Life, which is as old as the Indian civilization, ascribes a host of qualities to garlic, both prophylactic and curative.

Ayurveda describes garlic in the treatment of intestinal dysentery and flatulence. Garlic is said to have a special role in curing ‘vata roga’ or nervous ailments. Furthermore, it has a prominent use to prevent aging and to promote longevity. Whether these beliefs are due to garlic’s own capacity for an astonishing long shelf life is a moot point, but it is a fact that garlic retains its moisture and freshness for months together unlike other vegetables that wither and decay within hours or days.

Louis Pasteur verified the antiseptic properties of garlic in 1858. Garlic oil has been found to wipe out many strains of fungus and yeast including some that cause vaginitis.

Garlic is potent in combating and preventing many ailments. Garlic slows down the growth of breast cancer cells and prostate cells under laboratory conditions. Garlic also inhibits the growth of tumours of the colon, rectum, esophagus and skin in rodents. Garlic may lower the risk of cancer by preventing free radicals from forming. These molecules - normal products of cell metabolism - are prime suspects in the development of tumours because of their tendency to change DNA, cell membranes and cellular proteins. Garlic may also cut down thickening and hardening of arteries known as atherosclerosis

by preventing them from adhering to the lining of the blood vessels. Garlic also reduces cholesterol levels up to 9 per cent and every one per cent reduction in cholesterol translates into a two per cent reduction in risk of a cardiac condition. Garlic also helps the reduction of body fat. The Chinese too had listed garlic in their indigenous pharmacopoeia.

Medical investigations show that fresh garlic contains the odourless sulphur compound known as alliin. When cut open, alliin reacts with the enzyme alliinase and is decomposed to form the foul-smelling alliicin which further breaks into a number of smelly sulphur products.

Research findings have shown that garlic is an effective diet supplement for lowering cholesterol or as a substitute for other cholesterol-lowering drugs. The two sulphur compounds found in garlic - diallyl sulphide and s-allyl cysteine - have prevented the development of cancer in laboratory tests on animals.

There are various preparations for its intake. It may be taken raw (3-4 cloves per day) or as a *rasayan*, prepared by boiling garlic in milk. Another preparation known as "*lassanadi vati*" is also useful. Several leading pharmaceutical firms are now manufacturing preparations from garlic on a commercial scale.

ALOE VERA

Called "the elixir of youth" by the Russians, "the herb of immortality" by the old Egyptians or the "harmonious remedy" by the Chinese, Aloe Vera is without a doubt the medicinal herb most widely known for its noticeable impacts on health and at the same time the ingredient most widely used in the cosmetic industry. Not one study conducted so far was fully able to explain the wonders which lie within this herb and how its compounds work together in a miraculous way to bring about the treatment or the alleviation of some of the most serious illnesses like cancer or AIDS.

Aloe Vera or "Aloe Barbadosensis" is a plant which originated in North Africa and spread to the fertile lands with mild climate. Its physical aspect is similar to that of the cactus; the thick rind hides a succulent core formed mostly of water.

The aforementioned herb gained worldwide recognition and has been intensively used from the oldest of times due to its extraordinary features. Just about every important civilization used it for its beneficial effects over health and beauty. Egyptians would mix aloe with other herbs while preparing remedies for internal and external anomalies. After the Second World War, aloe vera was introduced in treating the victims of the catastrophes from Nagasaki and Hiroshima because of its ability of mitigating the pain of the patients and renewing skin tissues.

The most often used substance from this herb is the aloe gel, a thick viscid liquid found in the interior of the leaves. The leaves are used in the treatment of burns and the aloine - a bitter milky yellowish liquid is used as a laxative. The herb contains: 20 minerals (Calcium, Magnesium, Zinc, Chromium, Selenium), 12 vitamins (A, B, C, E, folic acid), 20 aminoacids from the 22 which are necessary to the human body, over 200 active components including enzymes and polysaccharides. All the active substances enumerated before contribute to the therapeutical value of the herb. We shall move on to presenting the main effects that the herb has over the human body: it toughens up the immune system owing to the 23 peptides contained by the aloe vera, it accelerates and regulates the metabolism, purifies the human body from toxins, bringing about a feeling of calm. Moreover, aloe vera has an antiseptic effect (by destroying the bacteria, viruses and fungi), disinfectant capabilities and can also stimulate the cell-renewing process. Aloe vera nourishes and supports the digesting of aliments. Cutting across the human organism, aloe vera manages to bring the human body to a general balanced state.

Aloe vera has proved its efficiency from the simplest allergies to the treatment of wounds and skin infections and even to its usage in alleviating more serious afflictions. With the help of this herb a wide variety of internal and external afflictions are controlled, like: asthma, virosis, arthritis, arthrosis, gingivitis, bronchitis, pharyngitis, intestinal inflamations, constipations, obesity, sprains, muscle strains, cutaneous inflamations. The efficiency of the herb was also proven in the cases of anemia, deficiency illnesses, insomnia and depressions and the B-sisterole from the Aloe vera brings about the lowering of the cholesterol level. Also, this herb is used for controlling the side effects of chemotherapy and radiation therapy, diabetes, hepatitis and pancreatitis and multiple sclerosis.

A wide array of products with curative and therapeutic effects is obtained from aloe vera. This herb is one of the main attractions of the pharmaceutical and cosmetic industries and also the most widely used ingredient - starting from vitamins and laxatives to face creams and body care lotions. Aloe vera gel contains B-sisterole, powerful anti-inflammatory and anti-cholesterol formulas and lupeol - a strong antiseptic tranquilizer. The aloe-based lotions and gels are used as protections against the powerful sunlight and as a remedy against sunburns. Ointments having aloe as a main ingredient moist the skin and protect it against bug stings and scratches. Furthermore, the aloe-based ointment is efficient in treating acne. Owing to its proprieties, Aloe vera was incorporated in the composition of deodorants.

What should be noted is the fact that this herb can be also administrated internally due to its high nourishing influence. When mixed with other fruits, aloe vera can be ingested as an excellent natural beverage rich in vitamins and minerals. Also, it is recommended that it is ingested during travels to prevent dehydration.

BANANA

The banana, a plant originating in South Africa, is considered to have been the first fruit to appear on the Earth, having been mentioned in writings that date back to the beginning of mankind. Today it is the favorite fruit of many people, being rich in vitamins and minerals.

The banana plant is a herbaceous plant of the family Musaceae, which because of its size and structure, is on many occasions confused with a tree. The plant is grown for its fruit, being of southeastern Asian origin.

Bananas that are destined for human consumption do not contain seeds. The plant produces two stems at the same time: a bigger one for the immediate obtaining of the fruit, and a smaller one, which produces the fruit 6-8 months later. The lifespan of a banana plant plantation is at least 25 years.

Bananas are true sources of energy. A banana contains potassium, proteins, fibers, carbohydrates and an association of vitamins: A, B, B6, C and E; it is rich in calcium, magnesium, iron, zinc and folic acid. These facts being taken into consideration, the banana is one of the healthiest fruits. It also contains serotonin or the substance of happiness, having an anti-stress role.

Other properties of bananas: especially helpful in anti-fat treatments, being very dense, it offers a sensation of satisfaction.

Being rich in iron, the bananas stimulate the production of hemoglobin in the blood, thus helping in cases of anemia. Because of its high potassium, but low salt content, it is indicated for those having problems with arterial pressure.

Being an aliment that is rich in fibers, the banana helps with constipation, through the regaining of the intestines' normal activity. Containing a type of protein, which the body transforms into serotonin, the fruit is indicated in treatments against depression, leading to an improved affective state. The banana is also indicated for calming of nerves, being used in treatments for the regulating of intestinal traffic. Having a fine and soft texture, it is also used in treating ulcer.

The fruit has the power of growing its concentration capacity. The potassium contained in bananas helps regulating heartbeats, brings oxygen to the brain and maintains the water quantity in the body at a constant level.

At moments of stress, the metabolism is accelerated and the level of potassium decreases, a situation in which the consumption of bananas is recommended. The fruit is also useful against smoking, helping the body regenerate after the effects of lack of nicotine. Many cultures see the banana as a refreshing fruit, which can decrease the physical and emotional temperature of pregnant women.

Against hangovers, a milkshake can be prepared, sweetened with honey. The banana calms the body and rebuilds the sugar level in the body, while the milk calms and hydrates the body.

Mosquito bites can be treated if the affected area is rubbed with the interior part of a banana peel. Bananas are used in cosmetics for treating dried complexions, limp skin and itches. In cases of solar burns or numbness from cold, a crushed banana can be applied on the face to calm pain and reduce inflammations.

It is recommended that bananas be consumed when they have only a few spots of brownish color because that is when it is richest in minerals and vitamins.

Creams based on bananas, used in cosmetics for treating dried complexions, are prepared from crushed bananas, a teaspoon of liquid honey is added and the mixture is stirred well. It is applied on the face under the form of a mask. It is kept that way for 15 minutes, and then washed away with mineral water. Another mask against itching is prepared of a crushed banana mixed with yogurt. It is applied on the face and kept for ten minutes before washing it away.

Facial lotion, for dried complexions is obtained like this: a very ripe banana is taken, crushed in the mixer, added to a glass of milk and a teaspoon of olive or sweet almond oil.

Recommendations

In the moment of the fruit's consumption, its color has to be taken into account. It shouldn't be eaten while it is of a pale yellow or green color because at such a time it contains starch, which is hard to digest.

Being rich in calories, it is recommended that those who are holding anti-fat treatments and who suffer from diabetes consume it moderately. It is not indicated for use in a severe anti-cholesterol diet. Bananas do not bear temperatures lower than 12 degrees and they should never be kept in refrigerators.

CASTOR OIL PLANT

The castor-oil plant is a herbaceous, annual herb of 1-3 meters in height, with a pivoting, ramified root, erect green or reddish stems. The leaves are large. The flowers have a yellowish color. The fruit has the form of a capsule which holds 3 brownish or ash-colored, mottled seeds, rich in oil. The plant blooms from July to September.

The castor-oil plant seeds contain over 50% fat, 20% proteins, glucides, mineral salts, water, oleic acid, toxalbumine, enzymes and vitamin E. These give the plant laxative and purgative properties, leading to the agglutination of the red cells.

Castor-oil plant is used most often as castor-oil. This exercises a benefitting action on the teguments, both at the epidermis' level and at the derm level.

Castor-oil is an efficient means of curing warts. The should be massaged for 10-15 minutes with the castor-oil. The treatment is followed 2 times per day, each day, until the warts start disappearing. For irritated mucous membrane and red eyes, 1-2 drops of castor-oil are applied on each eye.

In case of hemorrhoids, the anointing of the anus with castor-oil or the ingestion of 1-1/2 teaspoons of oil internally is recommended. The same oil is good for treating bruises, cuts, ulcerations or various eruptions of the skin.

A feather drenched in castor-oil is indicated to be used for anointing the affected areas. In cases of bronchitis and colds, the chest is massaged, using a mixture of 2 tablespoons of castor-oil and one of turpentine. The chest of the patient is rubbed with it, then enfolded in a wool scarf and then dressed in a cotton blouse.

Castor-oil has a stimulating effect of the growth of eyelashes and eyebrows. Also, it helps in some cases of alopecia and strengthens the roots. The hair roots are massaged with castor-oil. It is applied in the evening before going to sleep. The second day, the hair and the head's skin is washed well. The treatment is made 3 times per week until the wanted result is achieved. For regular usage, it is applied 2 times every month.

To soften the callosities and thick skin, the feet should be rubbed 3 times a week with castor-oil, dressed in cotton socks and left like that for the night.

Castor-oil is also recommended in treating moles and hepatic pigmentation. The affected areas are rubbed insistently with castor-oil in the evening and in the morning. The effects are visible after about a month.

For nails which are flaking off or which break off easily, the treatment with castor-oil is recommended. In the evening the oil is applied on the nails and rubbed well for an hour. The treatment should last 2 months.

Castor-oil is fabricated thus: the seeds are harvested at their complete maturity, manually or mechanically. They are dried, decorticated and cold pressed for obtaining the oil.

Warning

The therapeutic castor-oil is not toxic. The toxic effect is only manifested in cases of swallowing seeds which would lead to the coagulation of fibrin, the agglutination of erythrocytes, lesions of the blood vessel walls, irritation of the gastro-intestinal mucous, hepatic and renal lesions.

CHAMOMILE PLANT HEALTH BENEFITS

Maticaria Recutita or **Chamomile** - its popular name - is a herbaceous, annual and hibernating plant originating in south-eastern Europe, which nowadays has spread to all continents. The scientific name "Matcaria" derives from the Latin word "mater" (mother) and suggests the many uses in mothers' diseases and generally in that of women. Because it is a common plant, it can be found anywhere, in uncultivated areas, on fields, on road edges and so on. The plant loves heat, light (which influences the essential oil contained), and moist soils.

The chamomile stem, reaching growing up to 60 cm, is striated and ramified at its base, and each branch has flowers. The flowers with their pleasant flavor, bloom from May until late August or early September. In this interval, the best harvesting period is noon. Noticeable is the fact that inflorescent flowers are harvested before becoming mature. For conservation the plants are put to dry in a thin layer in a dry and shady place, after which they are kept in paper bags. In ancient times, chamomile was used to control neuralgia and rheumatism (especially the particular one) and the ancient Egyptians used it to decrease fever. It is also mentioned in old books about medicinal plants that chamomile's oil drives away fatigue from the limbs.

Chamomile flowers contain: essential oils (etheric oil: 0.38 - 0.81%), vitamins B1 and C, mineral substances (phosphorus, potassium, silicon, iron, manganese, calcium, copper, lead, zinc, zirconium), glucides, lipids (in small quantities) and acids. The plant has calming, analgesic, disinfecting and antiseptic, antispasmodic and tonic actions. At the same time, chamomile has an antitoxic action through disactivating the bacterial and carminative toxins, favoring the elimination of intestinal gasses. Externally, chamomile has cicatrizing, emollient and anti-inflammatory effects. Because of its antiseptic (it destroys the microorganisms from the tegument) and decongestive properties, chamomile also has many applications in cosmetics, being recommended for irritated, damaged or fat complexions.

Chamomile can be used for an entire series of afflictions and diseases. No matter if we're talking about gingivitis, dental abscess (and dental pains generally), tonsillectomy, stomatitis, hyperacid gastritis, ulcer, enterocolitis, diarrhea, hemorrhoids, flues, colds, sinusitis, bronchial asthma, rheumatism or insomnia, chamomile is a true adjuvant. Being a good sedative, it can be used against stress and anxiety. Chamomile also helps to drive away menstrual problems (as amenorrhea) and other pelvic diseases.

Chamomile infusion

In preparing this infusion, a teaspoon of chamomile flowers is added to a liter of boiled water. The mixture is left a few minutes before being consumed. Inhaling the vapors emanated by the infusion helps in healing colds and sinusitis if the patient remains in a warm place. The tea can be administered to children, when they suffer from bad dispositions, cramps or colics - abdominal pains.

Used externally, the infusion can be added to the bath water (four handfuls of flowers to a bathtub) or in the head washing water (one handful). The hair - especially the blond one - becomes silky and shiny. The complexion is also refreshed if it is cleaned with chamomile infusion. Also, conjunctivitis and eye inflammations heal faster with the help of this mixture. It can also be used for gargle (in cases of toothaches), cutaneous eruptions, or cleaning wounds.

Chamomile oil

In a bottle filled with chamomile flowers, cold-pressed olive oil is poured. The bottle is then kept in the sun, well corked up, for a period of approximately two weeks. After this stage, the oil is conserved in the refrigerator.

Chamomile ointment

It is obtained relatively easily, out of two handfuls of fresh chamomile flowers added to 200g of lard. The operation is done when the grease is already warmed. After it starts boiling and spume is formed at the surface, it is all covered and kept in a cool room. After 24 hours, the mixture is warmed again and filtered with the help of a cloth.

Chamomile poultices

A tablespoon filled with chamomile is emptied in a liter of hot milk. After a few minutes, the mixture is filtered and used in poultices. Caution is required as the poultice has maximum effect with warmth. Another way of obtaining poultices: filling a small bag of textile material with dried chamomile flowers. The bag is then introduced into the oven on a tray and heated up for a short time. Then the bag is applied locally for eliminating corporal pains.

BENEFITS OF GARLIC

Garlic is a plant native to Africa and central Asia. It was discovered and used by the ancient Egyptians, Babylonians, Jews, Greeks and Romans. Garlic earned a renowned place in the modern natural medicine. In the Middle Ages and Renaissance when the population was facing great plagues, garlic was used very often as a protective medicine. It gained its fame owing to some wrongdoers who fended off the plague by using antiseptic garlic vinegar. As a result, garlic was known as the best antidote against the plague under the name of "the vinegar of the four thieves". The diuretic qualities were discovered by Bartholius, who recommended it for treating ague, while Sydenham would recommend it as a dropsical treatment.

The active compounds of garlic are volatile oil, the mixture between sulfide and allyl oxide in an almost pure state, two very important mineral antibiotic components (sulfur, iodine, zinc, and manganese) and vitamins B and C.

The main therapeutic qualities of garlic describe it as being antiseptic, antibacterial, stimulating digestion, reducing high blood pressure, glandular regulator, diuretic and even cancer deterrent. **Internally**, garlic is not used so much due to the strong smell that remains in the mouth. Yet it is still being used often for treating various afflictions: the consumption of 2-3 cloves of garlic a day has wonderful results in treating pharyngitis and intestinal infections. It also counteracts flu complications and helps treat gout and insures a general state of health.

Externally, garlic enemas are effective against intestinal worms. Other usages of garlic are:

- ground and mixed in grease or oil it is recommended as an ointment. This mixture is named "devil's mustard" and is used and is used at treating white tumors;
- the mixture obtained from a clove of garlic mixed with camphorated oil used in rubbing the back and chest with is effective against scabies;
- the disinfection of wounds can be successfully done by grinding a clove of garlic and mixing it until a solution is obtained (10% garlic juice and 1-2% alcohol) or by making dabs or garlic (30 g of ground garlic put to sit in 500 ml of vinegar for 10 days);
- the mixture obtained from a clove of garlic mixed with camphorated oil is successfully used in treating asthenia and rheumatism;
- for the individuals who are hypertensive it is recommended that they take a mixture prepared from garlic (2-3 cloves of garlic are grained and left to sit in 1 liter of alcohol for about 15 days). The resulting mixture is consumed by taking two spoonfuls everyday before eating;
- cases of bad acne get better by rubbing the inflamed spots with half of garlic clove;
- wounds [and] blackheads can be treated by applying poultices made of ground garlic. Results are visible after two weeks. Poultices of warm oven-cooked cloves of garlic can be further used to protect healthy skin.

Garlic juice is another useful treatment obtained from this herb. It has noticeable results in treating: hypertension, infectious diseases, lung problems, bronchitis, tuberculosis, asthma, intestinal parasites and can even deter cancer occurrence.

Indications:

- several drops of garlic juice digested with a small quantity of sugar are efficient in stopping a bout of asthma;
- a wad of cotton soaked in garlic juice calms an ear ache;
- eliminating the intestinal worms, a mixture of 20 ml of garlic juice with 200 ml of warm milk drunk early in the mornings is very efficient as a treatment.

Caution! To eliminate the unpleasant smell of garlic it is advisable to chew 2-3 coffee beans, aniseed or caraway, an apple or a piece of parsley.

Another less known benefit that garlic has is its aphrodisiac effect. Research has shown that garlic is capable of improving the blood flow through the veins and also the sexual performance in men. Unfortunately, garlic consumed in normal quantities is unable to reach spectacular results, but the edible products containing garlic may aid you in this sense.

BENEFITS OF JASMINE PLANT

Jasmine (*Jasminum officinale*) is a flowery shrub containing white or yellow flowers, native to Mediterranean countries (although there are a considerable number of people that say it comes from India). The shrub has a ramified crown, angular green long twigs, obtuse flowers and it is cultivated as a decorative plant (*Jasminum fretticans*), or for its industrial and medicinal uses. The flowers can be small or large, white with a nice perfume that increases in strength in the evening. Jasmine grows quickly. It can grow in the shade, but it grows better in sunny and breezy areas.

Widely known for its big consumption of jasmine tea, the Chinese civilization drinks green tea during the spring and summer times as well as in autumn and especially in winter, jasmine tea. This drinking tea habit appeared in the north and north-east region of China.

From jasmine flowers it is extracted the well-known and highly expensive oil. The high cost is explained by the fact that in order to extract 2.2lb of jasmine essence 2200lb of fresh flowers are needed. Nevertheless, its effects over an organism make that process worthwhile. The herb has the power to eliminate the stress and depression, and it can help regain self-confidence. The jasmine flowers are used in biotherapy and perfume industry.

The fresh jasmine flowers contain a high amount of etheric oil. Beside this oil, the flowers also contain benzilic acetate, linalcohol, benzilic alcohol, indole and jasmon. All these substances confer jasmine aphrodisiac properties. Among other properties of the jasmine flowers are: the improvement of digestion, adjuvant in the toxins elimination and the loose of weight. They also help the acceleration of metabolism, they improve the blood circulation and it is commonly known their aphrodisiac effect.

How can the flowers be used? In the simplest way possible: making tea out of them! Other ways: macerated in oil or alcoholic extract. The tea can be use to treat headaches, coughing and the macerate for rheumatism.

In aromatherapy, the jasmine oil is recommended for any kind of physical pain. It is also good advisable to have it around in case of birth. Even more, it is a powerful antiseptic, sedative and tonic recommended for breathing difficulties, coughing and nervous debility. It also calms any skin affliction and it can be used in small amounts for calming pains.

Jasmine tea

The jasmine tea is known by the majority of nutritionists as being an adjuvant in losing weight. The jasmine tea does not have any energizing properties like the green tea, but it has sedative properties and it can regulate blood circulation and arterial tension. The taste of one jasmine tea cup is sweet and combined with green tea will offer powerful tonic and energetic results. Surely, it isn't one of the most powerful aphrodisiacs, but the jasmine tea helps an organism relax and regain its strength in the stress or physically and psychic overworking periods.

Jasmine oil

The adepts of the aromatherapy use this jasmine oil in combination with drops of ylang ylang oil. This mixture helps regaining the healthy state of mind and body.

Warning

It isn't recommended to consume jasmine tea in big quantities, especially in cases of pregnancy. It is also not recommended to consume jasmine tea on an empty stomach, to prevent causing high acidity. After 5 pm it is best if the consumption of jasmine tea is ceased to prevent insomnia.

LEMON

The Romans used this fruit for improving the taste of their culinary preparations. Today lemon is well known not only as an aliment but also for its therapeutic properties. In aromatherapy, essential lemon oil is used in treating hepatic affections.

The fruit of the tree named Citrus Limon originates in India. The Arabs were those who have brought it later on to the area of the Mediterranean Sea. Starting with the 4th century, the Romans started using this fruit for improving the taste of their foods. Today lemon is well known not only as an aliment but also for its therapeutic properties. In aromatherapy, essential lemon oil is used in treating hepatic affections. Because of its chemical composition - especially because of its rich containment of vitamin C - lemon is also used successfully for preparing products with cosmetic purpose.

Lemon juice - with 30% fruit - contains citric acid, calcium and potassium citrates, glucides (glucose, fructose, sugar), mineral salts and oligoelements (iron, calcium, silicium, phosphorus, manganese, copper), vitamins (B1, B2, B3, C, PP, A, carotene). All these compounds help the body in its growing process. Citric acid, for example, stimulates the absorption of calcium through the intestines (mineralization action), neutralizes the effect of uric acid and reduces the gastric acidity. While vitamin C is richly contained by lemon, it has an anti-oxidizing role, vitamin PP offers vascular protection. Also, vitamin C has an

important role in the synthesis of collagen in the tissues, cartilages and bones, also being anti-inflammatory. Furthermore, through the contribution of vitamin C, the burning of fat is also accelerated. A direct action of this is manifested through the fluidization of the blood - a process which does not limit the coagulation of blood in case of injuries. Therefore, the blood circulates easier through the blood vessels, becoming more fluid. We will now present the rest of the benefiting effects produced by lemon consumption: strong antioxidant, bactericide, febrifuge, tonic for the sympathetic nervous system, cardiac tonic, anti-gastric acid, diuretic, anti-rheumatic, anti-gout, anti-arthritis, sedative, anti-sclerotic, vein tonic, anti-scorbutic, depurative, remineralizing, anti-anemia, stimulates gastro-hepatic and pancreatic secretions, haemostatic, carminative, and vermifuge.

Because of vitamin C in lemon, one can treat with great ease hepatic or respiratory diseases, varix or even obesity.

Lemon juice

With its bactericide and antiseptic action, lemon juice activates the white cells and strengthens the body's immunity. The lemon juice diet usually starts with the daily consumption of the liquid obtained from 10 lemons and continues with the progressive decreasing of the number of lemons through the period of four to five weeks. Lemon juice drops can be placed in nostrils (repeatedly) for controlling colds and sinusitis. Lemon juice is also helpful against dandruff if the scalp's skin is massaged with it. This way, blood circulation is intensified and the hair becomes shiny and healthy.

Used externally in cosmetic purposes, from lemon juice a numerous series of natural remedies can be prepared for various problems. For example in case of greasy complexions, a mixture of one teaspoon of lemon juice, one of grape juice and one of honey is recommended. The paste is applied on the face and then removed after fifteen minutes. For fragile nails, the following simple treatment can be used: for a few minutes, several times per day, the fingers should be kept in lemon juice. Another remedy, for cuperosis, is based on mixing a white of an egg (mixed until it becomes spume) with lemon juice. The result is locally spread on the affected areas and this process is repeated up to 4 times a day.

III. GREAT SCIENTISTS

NOBEL PRIZE FOR GENETIC DISCOVERY

2006 year's Nobel Laureates have discovered a fundamental mechanism for controlling the flow of genetic information

Dr Mello on winning

Two US scientists have been awarded the Nobel Prize for medicine for their pioneering work in genetics.

The work of Dr Andrew Fire and Dr Craig Mello could lead to new treatments for a range of illnesses, including viral infections and cancer.

They discovered a phenomenon called RNA interference, which regulates the expression of genes.

The process has the potential to help researchers shut down genes which cause harm in the body.

The breakthrough has also given scientists the ability to systematically test the functions of all human genes.

In its wake, many companies have been set up to develop research tools to make use of what has become a whole new industry.

Dr Craig Mello is based at the University of Massachusetts Medical School, and Dr Fire at Stanford University School of Medicine.

RNA interference occurs in both plants and animals.

It plays a key role in mobilizing the body's defenses against infection, and in keeping unstable genes under control.

The process is already being widely used in science as a method to study the function of genes.

Genetic instructions

The Nobel citation, issued by Sweden's Karolinska Institute, said: "The year's Nobel Laureates have discovered a fundamental mechanism for controlling the flow of genetic information."

Our genome operates by sending instructions for the manufacture of proteins from DNA in the nucleus of the cell to the protein synthesizing machinery in the watery cytoplasm.

These instructions are conveyed by another form of genetic material called messenger RNA (mRNA).

In 1998, Dr Mello and Dr Fire published a paper in the journal Nature detailing how RNA interference can subvert this process - effectively shutting specific genes down.

Tiny snippets of RNA dupe the cell into destroying the gene's mRNA before it can produce a protein.

Scientists have speculated that the mechanism developed hundreds of millions of years ago as a way to protect organisms against invading viruses, which sometimes create double-stranded RNA when they replicate.

Huge importance

Professor Nick Hastie, director of the Medical Research Council's Human Genetics Unit, said the fact that the work had been recognized by the Nobel committee just eight years after it was published indicated just how important it had been.

He said: "It is very unusual for a piece of work to completely revolutionize the whole way we think about biological processes and regulation, but this has opened up a whole new field in biology."

Professor Hastie said previously RNA had been thought to have very little role in regulating genes - in fact some thought it nothing more than a by-product.

Dr Mello and Dr Fire's work had shown that in fact it plays a key role in gene regulation.

The Nobel Prize is worth \$ 1.4mln.

IV. ALTERNATIVE MEDICINE

ALTERNATIVE THERAPIES

In recent years millions of Americans have turned to chiropractic, acupuncture, homeopathy, biofeedback, visualization, and crystal healing as alternatives to conventional medicine, or have “mixed and matched” conventional therapy with other, seemingly incompatible healing options. In 1990 Americans made 388 million visits to primary care physicians within the medical “establishment” and 425 million visits to providers of nonconventional therapies. The highest use of alternative approaches was reported by relatively well educated and affluent whites from 25 to 49 years of age.

Alternative therapy, in fact, is reshaping conventional medicine. Some medical schools offer courses on nonconventional medical practices and have begun to reexamine techniques once dismissed as quackery. It is not unusual to find traditional cancer therapy being supplemented by relaxation exercises and support groups, or to see studies in leading medical journals on the impact of yoga or biofeedback on coronary artery disease, or to encounter best-sellers written by prominent physicians about the influence of laughter or hope on the immune system.

Many physicians question the more extravagant claims of alternative therapies. They warn that these practices, if not downright dangerous in their own right, may keep people from seeking effective treatment. But it is becoming harder to deny that at least *some* alternative techniques work for *some* patients even if medical science cannot explain exactly how.

Furthermore, the growing acceptance of alternative therapies has led some critics of mainstream medicine to perceive it as the harbinger of a medical revolution. They predict that Western medicine someday will evolve from its narrow biochemical model to a “biopsychosocial” one that incorporates holistic thinking: a perception—sometimes regarded as a traditionally feminine one—that the body is an integrated unity and that emotional, spiritual, social, and environmental factors are as crucial in determining illness as physical trauma or biochemical events. While acknowledging that viruses play a role in inducing colds, alternative healers may also consider stress in the workplace, mental depression, and inadequate diet equally important. Before this century such thinking was common in conventional medicine. The fact that many traditional doctors have begun to reincorporate these ideas into their studies and practices reflects the success of alternative therapy advocates, as well as the frustration that many patients feel with conventional medical care.

Alternative therapies can be divided into three basic categories: botanical healing, hands-on therapies, and mind-body techniques. Some schools of

practice, such as naturopathy, macrobiotics, and Ayurvedic medicine (a 4,000-year-old Indian healing tradition) rely on more than one form and sometimes advocate changes in diet or exercise patterns as well. Some alternative practices are derived from mainstream medicine as practiced in other parts of the world, while others stem from contemporary “New Age” thinking.

BOTANICAL HEALING

Herbal medicine uses pills, teas, or extracts from flowers, leaves, or other whole parts of plants such as peppermint, chamomile, garlic, or aloe vera to treat a wide range of ailments. In aromatherapy, essential oils from flowers and plants are massaged into the skin or inhaled. Recent evidence that certain Chinese and Indian herbs contain the same chemicals active in Western pharmaceuticals increases the likelihood that some of these medications actually work beyond their placebo effect.

But buyers should beware: even potentially effective herbs can lose potency if exposed to air, light, or moisture—as many of them are when sold in bulk or powdered into capsules. And just because a substance is “natural” does not mean it is safe: arsenic is natural, too, after all. Taken over long periods of time or in large doses, many of the plants used in herbal remedies can cause extensive damage. Comfrey, for example, which is sold as a digestive aid, may seriously damage the liver. Large doses of licorice, used to suppress coughs, can raise blood pressure and alter heartbeat. And herbal medicines may carry residues from pesticides or molds. Because they are regarded as “foods,” herbal preparations are exempt from the Food and Drug Administration’s stringent regulations requiring all drugs to be proven both safe and effective.

Another botanical alternative is homeopathy, a school of thought that has been around since the late eighteenth century and is based on the premise that disease can be treated with highly diluted doses of the same substances that cause it. Extremely popular in the nineteenth century, homeopathy dwindled almost to extinction until the early 1980s. Now, according to the National Center for Homeopathy, there are over 2,500 homeopathic physicians as well as 3,000 to 5,000 licensed health professionals who practice homeopathy. Prepackaged homeopathic remedies for aches, pains, allergies, and colds are routinely sold over the counter.

Though some European studies have demonstrated a therapeutic effect of homeopathic herbs on influenza, headache, and allergies, the evidence is unconvincing to much of the American medical establishment. Because homeopathic preparations are often so dilute that no active chemical remain, the FDA has tended not to require proof of safety and efficacy.

HANDS-ON THERAPIES

CHIROPRACTIC MEDICINE

Premier among the hands-on therapies is chiropractic medicine, which, with approximately 45,000 practitioners, is currently the third largest health care profession in the United States. Once labeled quacks and impostors by conventional medical doctors, chiropractors not only have survived for nearly a century but also have gained both legal and public acceptance. Although they do not have medical degrees, chiropractors are licensed to practice in all 50 states, and their services are covered by many insurers. Chiropractic's main therapy—the manipulation of the spine—is now generally acknowledged as a valid treatment for acute low back pain.

Nevertheless, most medical doctors still dispute the claims of many chiropractors that misaligned vertebrae (“subluxations”) underlie a plethora of human conditions, from childhood ear infections to headaches to high blood pressure. They also deny that chiropractic manipulation should be used to treat or prevent these conditions. Without offering evidence convincing to the medical profession, many chiropractors maintain that misaligned vertebrae impair the nervous system, thereby lowering the body's defenses and contributing to disease. In any event, for some of the 30 million Americans who suffer from back pain, chiropractic manipulations may indeed provide relief.

ACUPUNCTURE

Acupuncture, another hands-on therapy, is gaining acceptance in many circles. Still regarded as an alternative practice in the United States, it has been a conventional therapy in China for thousands of years. Acupuncturists contend that the body consists of a system of specific “vital energy” or “life force” (called *qi* or *chi*) pathways. Disease and pain result when the energy flow of these pathways is interrupted. Acupuncturists say they can rebalance the flow by inserting hair-thin needles into precise points along the pathways and then manipulating them.

Particularly impressive to many Western researchers is acupuncture's effectiveness as a pain reliever and surgical anesthetic. Western science has yet to explain how this works. The most convincing hypothesis so far is that the puncture somehow stimulates nerve cells to produce chemicals called endorphins, the body's natural painkillers. A few animal studies have shown that inhibiting the release of these chemicals can block acupuncture's anesthetic effect. In other studies animals became partially anesthetized after being injected with body fluids from other animals that had undergone acupuncture. Whatever the explanation, recent reports in esteemed medical journals indicate that acupuncture can relieve chronic back pain, as well as the pain of osteoarthritis

and rheumatoid arthritis. It is also used as a surgical anesthetic and to relieve withdrawal symptoms in recovering alcoholics, drug addicts, and cigarette smokers.

In acupressure the same energy points cited by acupuncturists are massaged with finger pressure, primarily to relieve stress. Shiatsu is the Japanese equivalent of this technique. Similarly, practitioners of therapeutic touch claim to unblock energy flow by moving their hands over a patient's "energy fields." Proponents insist that this technique not only improves overall well-being but also relieves pain and anxiety and even speeds wound healing.

REFLEXOLOGY

Reflexology is yet another massage technique based on Eastern teachings, this time with emphasis on the feet. Reflexologists have mapped specific areas of the sole to every organ, gland, and body part. The heel corresponds to the lower body, the middle of the sole to the digestive organs, the ball of the foot to heart and lungs, and the toes to the head. By stimulating relevant points, reflexologists claim to be able to relieve pain and stress and improve circulation in corresponding areas of the body. Most conventional doctors are skeptical of this technique, suggesting that self-massage, Epsom salt baths, and foot exercises provide equivalent health benefits.

Even without an elaborate map of energy pathways, alternative healers use other massage techniques to relieve stress and discomfort. "Hellerwork," for example, involves numerous 1 ½-hour deep-massage sessions on the theory that pain and tension in body structures increase risk of injury. To ease muscle pain, stress, depression, ulcers, tension headaches, exhaustion, and various respiratory and digestive woes, the "Alexander technique" teaches patients how to improve posture in a dozen or so sessions. Conventional practitioners generally question the more grandiose benefits attributed to such practices, but many acknowledge that at the very least these techniques may relieve stress simply because the therapist is paying attention to the patient.

MIND-BODY TECHNIQUES.

Alternative practices based on the influence of mind over body have been entering the mainstream lately, partly because of recent discoveries in a new field called psychoneuroimmunology. Researchers in this field explore the way behavior and emotions influence the nervous and immune system, and their findings are starting to close the mind-body gap that so bothers critics of modern Western science. For example, research at Stanford University showed that

women with advanced breast cancer receiving standard therapy live twice as long if they also participate in a support group.

Psychoneuroimmunology could potentially provide scientific evidence for a belief held by healers, both mainstream and alternative, from the earliest days of medicine: that healing the mind is an integral part of healing the body. The evidence gleaned so far has not convinced medical scientists that mental states can actually cause, cure, or prevent diseases. But this type of research does open new possibilities for easing the discomfort of disease, surgery, or chemotherapy.

Biofeedback is a particularly popular mind-body technique. Through it, patients learn how to regulate their ordinarily involuntary body functions such as heart rate, temperature, and muscle tension. Hooked up to machines that measure these functions, patients watch a display or listen to a tone that tells them how close their physiological responses are getting to a desired result. Eventually they learn to control responses without feedback from the machine. After ruling out physical problems, many conventional doctors now use biofeedback to treat pain and anxiety, migraine or tension headaches, incontinence, or chronic pain syndrome. Biofeedback is often a first-choice treatment for Raynaud's phenomenon, a condition mainly affecting women, in which exposure to cold makes fingers white and blue, cold, and painful (see entry). And many private insurers are willing to pay for biofeedback training sessions.

Another mind-body technique increasingly used by mainstream physicians is **hypnosis**—even though, as with biofeedback, understanding of the physical mechanism or even hard evidence of effectiveness remains limited. Once regarded as sheer chicanery, hypnotherapy is now practiced by thousands of medical doctors in conjunction with conventional medical techniques. It can be used to help patients break bad habits, overcome phobias and sexual dysfunction, and cope with pain. Therapists help patients go into a trancelike state in which they lose awareness of their body and become more responsive to suggestion. When the session ends, patients remember everything that happened.

The American Medical Association's Council on Scientific Affairs has called for more research into hypnotherapy to help elucidate its role and means of action. Some practitioners hypothesize that hypnotherapy stimulates the brain's limbic system, which has been linked to emotions and normally involuntary activities such as digestion and hormone regulation. This link may explain in part the observation that hypnotherapy has helped control the stomach acid secretions of ulcer patients, reduce the discomfort of chemotherapy, and even speed recovery from burns.

Other mind-body techniques aim at reducing stress, a poorly defined concept that has been linked repeatedly to a series of ailments. Therapists at the Harvard affiliated Mind/Body Medical Institute in Boston teach relaxation techniques such as **meditation** and **yoga** to help relieve stress in patients with coronary artery disease, infertility, insomnia, chronic pain, AIDS, and cancer.

Often medical centers around the country have established their own meditation or massage clinics or have simply begun to emphasize listening and touching as crucial aspects of treatment. And stress-reduction techniques such as meditation and yoga are now often taught to patients by conventional health care workers, most commonly nurses, psychologists, and social workers, to help them face pain more effectively, including the pain of labor and childbirth. How, or if, they influence the course of any given disease is not known.

Even less conventional are New Age *relaxation devices* such as *flotation tanks* and *isolation chambers*, which separate patients from all environmental stimuli. The same can be said for *bioenergetics*, in which the therapist passes an invisible and unmeasurable “energy” to the patient. In *crystal healing* energized light is supposedly passed through quartz or other colored minerals. Some patients claim to relax with the help of a “synchroenergizer,” which surrounds them with New Age music and pulsing lights. For all these practices, evidence of any therapeutic effect that satisfies the standards of conventional medicine is lacking, and consumers are wise to be skeptical.

Visualization (guided imagery) is a relaxation technique which involves learning to picture each muscle relaxing. Introduced in the 1970s to improve the performance of athletes and musicians, visualization is also used to promote healing. Therapists teach patients to imagine their body conquering microorganisms or righting a biochemical imbalance. Although evidence for successful cures remains largely anecdotal, many hospitals and private psychologists have ongoing visualization groups for patients battling serious illness.

CHINESE MEDICINE

The origin of Chinese medicine is a fascinating story. The first recorded attempt at conceptualizing and treating disease dates back to about 1500 BC during the Shang dynasty. Tortoise shells with inscriptions dating from that time have been found, and it is thought that these were used for divination in the art of healing. The philosophical basis of much of the very early Chinese medicine seems to have been to seek harmony between the living and their dead ancestors, and the good and evil spirits that inhabited the earth.

Professor Joseph Needham, one of the greatest living experts on Chinese scientific philosophy, describes some aspects of the ancient Chinese system of science as mediaeval and retrogressive. He feels that many of these concepts have distorted that development and obvious potential of Chinese medicine. There is undoubtedly an element of truth in this but there is still a great deal of useful and valuable information within the traditional Chinese approach to medicine.

The Western doctor observes the facts before him and uses the current physiological theories to explain them. Chinese medicine is based on a much wider world view and these ideas are woven into a complete and intact system based on a philosophy different from that of modern Western medicine. The concepts of Yin and Yang, and the number five, are two of the more important ideas that permeate much of traditional Chinese scientific thought.

Yin and Yang are opposite aspects of the material world. Like night and day they are interdependent, and the existence of one end of the spectrum presupposes the existence of the other aspect; i.e. Yin is necessary for Yang to exist, and vice versa. The idea describes the fundamental fluctuating balance of nature. A modern concept that pre-supposes the existence of Yin and Yang is ecology, one of the main principles of which is that the forces of the environment must be in a fluctuating balance.

The number five is also very important to Chinese thought. For example, there are five notes in the musical scale, five tastes for food and five elements in the physical world (earth, fire, water, wood and metal). The five elements are not just atomic constituents of matter, they have also been described as the five transitional stages of all physical materials.

Visiting a Chinese pharmacy in the Republic of China is much like being inside a miniature museum of natural science. Tucked away in row after row of tidy drawers are animal, plant, and mineral products, each with a particular purpose. Among the assortment of curiosities are cinnabar and amber, to relax the nerves; peach pits and safflower, to improve blood circulation; bear's gall to relieve pain and tranquilize; Chinese ephedra to induce perspiration; and ginseng to strengthen cardiac function.

The filling of a prescription ordered by a Chinese doctor is a fascinating process to watch. The pharmacist selects a few particular ingredients from the hundreds on his shelf. These are taken home by the patient, boiled into a "soup", and drunk. Confronted with such a steaming brew, you might ask yourself just what the basis of this ancient medical art is.

According to Chinese legend, Shen Nung, the Chinese father of agriculture and leader of an ancient clan, took it upon himself to test, one by one, hundreds of different plants to discover their nutritional and medical properties. Many of these turned out to be poisonous to humans. Over the millennia, Chinese have used themselves as guinea pigs in this same way to continue testing plants for their properties of inducing cold, heat, warmth, and coolness. They classified the medicinal effects of the plants on the various parts of the body, then tested them to determine their toxicity, what dosages would be lethal, and so forth. For example, the stem of Chinese ephedra is a sudorific; but its roots, to the contrary, can check perspiration. Cassia bark is warming in nature, and is useful in treating colds. Mint is cooling in nature, and is used to relieve the symptoms of illness resulting from heat factors. This accumulation of experience strengthened the Chinese understanding of natural phenomena, and

increased the applications of natural principles in Chinese medicine. The same principles described in the preceding are also applied to assess the patient's living environment, his life rhythms, the foods he prefers or avoids, his personal relationships, and his language and gestures, as a tool in better understanding his illness, and suggesting improvements in various areas. Once the excesses or imbalances are pinpointed, they can be adjusted, and physical and mental health and balance restored. This attainment of equilibrium in the body's flow of energy is the ultimate guiding principle of Chinese medical treatment.

In addition to the prescription of medicines, acupuncture is another frequently used tool of treatment in Chinese medicine. Its history antedates written Chinese language, but acupuncture was not fully developed until after the Han dynasty. Its theoretical base is the adjustment of c'hi, or the flow of life energy. C'hi flows through the body via the system of "main and collateral channels" of the body. At certain points along these channels, acupuncture needles may be inserted, or Chinese mugwort burned in moxibustion, to adjust imbalances in the flow of c'hi, and concentrate the body's self-healing powers in the points where needed. In 1980, the World Health Organization released a list of 43 types of pathologies which can be effectively treated with acupuncture. The use of acupuncture as anesthesia during surgery or for painless childbirth is no longer "news". Acupuncture is simple to administer, has few side effects, and has broad applications. It has opened up a whole new "hot" field of scientific and medical research.

In the Republic of China on Taiwan, the government has put great efforts into promoting the modernization of Chinese medicine. As a result, there are now people trained in both traditional Chinese and modern Western medical arts who have made commendable contributions to the treatment of hepatitis, high blood pressure, cancer, and other diseases that are so far difficult to treat. In the area of pharmacology, researchers have evaluated effectiveness, analyzed, tested, and formulated concentrated dosages of Chinese pharmaceutical products for commercial sale. The prescriptions for these drugs are easier to fill, and are much more convenient for the patient than the old boiling method. In the area of basic science, modern research is being conducted in the field of pulse diagnosis. The three fingers used in the past to determine illness through the feeling of the pulse are now being replaced by pressure reactors. The pressure reactor converts variances in pulse pressure into electromagnetic waves, and registers them on a screen. This data is then analyzed by a computer. Many important new discoveries have been made through unique combinations of traditional and modern science. In the Republic of China, the marriage of modern scientific precision with the art of traditional Chinese medicine is on the threshold of opening up a whole new world of medical diagnosis and treatment.

V. NUTRITION. VITAMINS AND MINERALS. MEDICINES

ANTI-INFLAMMATORY DRUGS

The redness, swelling, and heat that we call inflammation is part of the body's natural defensive response to infections and certain chronic diseases. Like fever and pain, inflammation is a warning sign that something has gone wrong in a part of the body and needs attention. But inflammation, when excessive, can become a problem in its own right—just as fever and pain can. Anti-inflammatory drugs are designed to combat this overzealous response. For example, inflammation in the joints (arthritis) is one of the most common conditions that is treated with nonsteroidal anti-inflammatory drugs (NSAIDs). The three principal types of anti-inflammatory drugs are aspirin, NSAIDs, and corticosteroids.

► **Aspirin**

For most people aspirin is the kindly old lady of the pharmaceutical industry: a mild painkiller at best, a placebo at worst. But contrary to folklore, aspirin (the common name for acetylsalicylic acid) is a versatile and powerful drug. In addition to its ability to relieve inflammation, it can reduce fever, soothe pain, and prevent blood clotting. But because it can also provoke a number of undesirable side effects in some people, aspirin, though not an exotic drug, should still be used with care.

Aspirin's anti-inflammatory properties have to do with its ability to inhibit the formation of prostaglandins, hormonelike substances derived from cholesterol. Prostaglandins are thought to promote inflammation and have been implicated in various types of pain, including painful menstrual cramps, some headaches, and other mild aches and pains. At large doses (up to 10 or 15-grain tablets per day) aspirin is one of the most effective and least costly drugs for treating arthritis.

The problem with high doses of aspirin, however, is that side effects become much more likely to develop. These can include ulcers, heartburn, nausea, vomiting, ringing in the ears, and kidney damage. More commonly, aspirin's ability to reduce blood clotting can promote bleeding in the gastrointestinal tract, which if prolonged can result in iron-deficiency anemia.

Many people confuse aspirin with another nonprescription painkiller, acetaminophen (Tylenol, Datril) and assume they can be used interchangeably. Acetaminophen can effectively reduce fever and relieve pain, and it may be preferable for treating those conditions in people who cannot tolerate aspirin. But acetaminophen cannot reduce inflammation and does not inhibit the blood's ability to clot. In children and teenagers especially, aspirin should be avoided

altogether because of the danger of developing Reye's syndrome, a life-threatening illness.

The many brand-name products available make it difficult for people to know just what type of analgesic they are taking. Many drug companies would have people believe that their aspirin-containing product has some special ingredient that somehow makes it more potent than regular aspirin. In fact, whether buffered or combined with other ingredients, generic or brand-name, cheap or expensive, aspirin is aspirin. There is no reason not to buy generic aspirin, and combine it with alkalizers such as milk or bicarbonate of soda (baking soda) to prevent stomach upset.

Because aspirin can produce serious bleeding disorders in newborns, it should generally be avoided by pregnant woman (especially during the last trimester of pregnancy) and by breastfeeding women. A pregnant woman who has taken high doses of aspirin anytime near her due date should tell her clinician because it could lead to excessive bleeding during childbirth. In some small studies aspirin has been associated with fetal malformations, but this association is controversial.

There are a number of exceptions to the rule about aspirin therapy during pregnancy. One is women who have a little-understood condition called APL (antiphospholipid antibody) syndrome. Antiphospholipid antibodies promote blood clotting. Women with APL syndrome have moderate to high levels of these antibodies in their blood, which may increase their risk of miscarriage and stillbirth. For this reason clinicians may advise women with APL syndrome to take one (80-gram) baby aspirin per day during pregnancy. The other situations in which low-dose aspirin therapy may be used is to prevent preeclampsia in pregnant women with a history of this condition. Aspirin can reduce the risk of preeclampsia in subsequent pregnancies from 20 percent to 2 percent.

Aspirin has many beneficial uses. It should be avoided, however, by anyone who has a history of ulcers, gastritis, asthma, gout, chronic hives, or a deficiency of vitamin K or the coagulation factor prothrombin or who has a bleeding disorder.

► **Nonsteroidal antiinflammatory drugs**

Like aspirin, NSAIDs reduce inflammation by inhibiting the synthesis of prostaglandins. Among the NSAIDs now available are sulindac (Clinoril), ibuprofen (Motrin, Rufen, Advil, Nuprin), fenoprofen (Nalfon), naproxen (Naprosyn, Anaprox, Aleve), tolmetin (Tolectin), flurbiprofen (Ansaid), piroxicam (Feldene), phenylbutazone (Butazolidin), diclofenac (Voltaren), meclufenamate (Meclomen), ketoprofen (Orudis), oxaproxin (Daypro), and nabumetone (Relafen).

Originally thought to have relatively few side effects, NSAIDs have been considered a promising alternative to corticosteroids in the treatment of arthritis. It now appears, however, that doses of NSAIDs necessary to relieve arthritis

pain can lead to ulcers and gastrointestinal bleeding in some patients. Other side effects can include rashes, wheezing, headaches, mental status changes, liver dysfunction, tinnitus (ringing in the ears), and elevations in blood pressure. There is also some evidence that the NSAIDs ibuprofen can trigger asthma attacks and may possibly damage kidneys if taken together with diuretics (drugs that promote fluid loss).

Despite the potential side effects, NSAID overall are still often preferable to other anti-inflammatory drugs. Ibuprofen, sold in both prescription and nonprescription forms, is a good alternative to aspirin and acetaminophen in alleviating pain, fever, menstrual cramps, arthritis, and other inflammatory conditions. The same can be said for naproxen sodium (Naprosyn), a longer-acting NSAIDs which has become available over the counter in the form of Aleve. Indomethacin (Indocin), available by prescription, seems especially good at soothing arthritis pain and muscle inflammation. Higher doses often relieve premenstrual symptoms such as cramps and migraine headaches. Pain that does not respond to one NSAID sometimes responds to another, so it may take a bit of experimenting before an effective one is found.

ARTIFICIAL SWEETENERS

For decades sugar, particularly refined white sugar, has had a bad name. A host of problems has been attributed to it over the years, including tooth decay, hyperactivity, mood disorders, premenstrual syndrome, yeast infections, and even some forms of cancer. Many of these attributions are overstated if not patently false, and there is no reason for most healthy people to fear the effects of moderate amounts of sugar in their diet. The only disease conclusively linked to sugar is tooth decay, and even here problems arise only when the sugar is consumed frequently or when it is contained in foods that cling to the teeth.

There is no denying, however, that sugar adds calories to the diet, and for people trying to lose weight, sugar can contribute to obesity. For them, as well as for people with diabetes (whose bodies metabolize sugar abnormally), artificial sweeteners may be a desirable way to enjoy otherwise forbidden foods. Chewing artificially sweetened gum may help prevent tooth decay or even retard the spread of preexisting caries.

► **Are artificial sweeteners effective?**

Artificial sweeteners are heavily used in the United States, particularly by women. They can be found in diet soft drinks and many dietetic foods, and are sold for home consumption in supermarkets. Restaurant tables frequently include little packets of artificial sweetener alongside the regular sugar.

It is therefore surprising that so little concrete evidence exists showing that artificial sweeteners actually help people lose weight. A small study of healthy, normal-weight people in France did indicate that eating aspartame-laced (or other low-calorie) food at breakfast led to an overall reduction in the number of calories consumed during the day. But in general there is no reason to think that drinking a diet soda or eating artificially sweetened pudding is going to fool the body into thinking it has reached its daily quota of calories. For the most part, artificial sweeteners simply allow people watching their weight to indulge in foods and drinks they would otherwise have to avoid.

The downside of artificial sweeteners is that dieters using them may develop a false sense of security and end up overindulging in some other food. For example, a woman who has a diet soft drink at lunch may feel entitled to an extra slice of pizza or a huge dessert, which more than compensates for any “saved” calories.

► Are artificial sweeteners safe?

Despite valiant efforts to prove otherwise, there do not seem to be any particular dangers associated with aspartame (Nutrasweet, Equal), which today is one of the most widely used major artificial sweeteners in the United States. Composed of two naturally occurring amino acids (one slightly modified), aspartame is 180 times as sweet as sugar (sucrose), so that the amount equivalent to 1 teaspoonful of sugar contains only 0.1 calorie. Aspartame destabilizes rather easily at high temperatures, however, or after long storage—as anyone knows who has tasted an old Diet Coke.

Early scares linking aspartame to brain tumors appear to be unfounded, and current concerns about potential neurological problems and behavioral disorders occurring in susceptible individuals remain purely anecdotal or theoretical. The only people who must scrupulously avoid aspartame are those with the hereditary disorder phenylketonuria (PKU). People with this disorder lack the ability to metabolize phenylalanine, a breakdown product of aspartame. Some women with interstitial cystitis (see entry) find that aspartame worsens their symptoms, especially the urgency and frequency of urination. The long-term safety of aspartame for pregnant women has never been determined.

Another artificial sweetener, saccharin, is still on the U.S. market, despite efforts to ban it in the late 1960s. The saccharin scare was based on studies linking high levels of saccharin consumption to bladder cancer in laboratory animals. Subsequent epidemiologic studies failed to confirm this link in human beings, however, and saccharin was eventually given a special exemption from the Delaney clause, a federal law that generally bans from the U.S. market all substances known to cause cancer in any species.

Many scientists now believe that saccharin—which is 500 times sweeter than sugar—is generally safe for human consumption. But because the effects on young children are unknown, many experts recommend that it be avoided by

children as well as by pregnant and breastfeeding women. The effects of heavy lifetime use of saccharin are also not known, though the same can be said for aspartame.

Yet a third artificial sweetener, acesulfame potassium (Sunette), has recently been introduced into the U.S. market in powder and tablet form. More stable than aspartame, acesulfame potassium is 200 times sweeter than sugar and contains no calories. Although some animal studies indicate that it may have certain toxic effects, the Food and Drug Administration maintains that there is no evidence of toxic effects in humans.

COFFEE

Breast cancer, osteoporosis, cardiovascular disease, cancer: for years coffee—or the stimulant in it, caffeine—has been suspected of causing these and numerous other disorders. Even earlier, health crusaders (участники общественной компании) blamed coffee for various crimes, including stunting growth (задержка роста) and corrupting the morality of youth.

Of the numerous studies done so far, nearly all have serious flaws (недостатки). Some, for example, have involved giving excessively high doses of caffeine to animals that do not have the same caffeine tolerance as humans. Other studies have included mainly or only men and thus are not necessarily applicable to women. Still other have not clearly differentiated the effects of caffeine from the effects of coffee per se. and many large-scale, well-designed studies have yielded results that contradict those of equally large-scale, well-designed studies.

What are the effects of caffeine?

Some of the ills attributed to coffee are not necessarily due to the caffeine it contains.

Some of the health problems that have been attributed to coffee consumption (потребление) may instead be due to other potentially harmful habits that tend to be more common in coffee drinkers—such as cigarette smoking, lack of exercise, or a higher than average amount of fat or alcohol in the diet.

All the same, caffeine is a mild stimulant drug that definitely has some clear-cut effects on the human body, including causing full-fledged (развившийся) drug addiction. In low doses it tends to induce feelings of alertness, well-being, and euphoria, and these effects last for several hours after ingestion (глотание, проглатывание). Still, as few as 2 cups of coffee can induce insomnia (бессонница) in some people, even if consumed as much as 6

hours before bedtime. Caffeine also may increase levels of the stress hormone adrenalin in the body.

At higher doses caffeine can lead to periods of inexhaustibility (неутомимость), as well as rambling (бессвязный) speech and thought and rapid heartbeat—all symptoms that can sometimes be mistaken for panic attacks or the manic episodes of manic-depressive disorder. People can become addicted to caffeine and experience symptoms of withdrawal (синдром отмены) —including insomnia, neck cramps (спазм, судорога), headaches, nervousness, and mild depression—when they stop using it.

A number of studies have suggested that caffeine may have a specific effect on women. One study of 841 women college students linked caffeine to symptoms of premenstrual syndrome. Women who think this might be applicable to them should make sure to avoid menstrual cramp medications (such as Midol) that contain caffeine.

Caffeine readily crosses the placenta, and there is some controversial evidence suggesting that drinking more than about 2 cups a day during pregnancy may slightly increase the risk of having a miscarriage (выкидыш). Thus, for the time being pregnant women may want to keep coffee consumption down to an average of about a cup a day, just to be safe. There is, however, no conclusive evidence at this point associating coffee drinking or caffeine with any known birth defect or growth retardation (задержка) in the fetus.

What are the links between coffee and disease?

The evidence linking coffee or caffeine to cardiovascular disease remains unconvincing. A few studies have suggested that caffeine, at least in certain doses, may have some effect on blood cholesterol levels or on temporary rises in blood pressure. And some studies have suggested that drinking more than 3 or 4 cups of coffee a day may moderately increase the risk of having a heart attack—at least in men. But other equally impressive studies have shown no such associations, so for now there is no reason to believe that moderate coffee consumption puts people at risk for cardiovascular disease.

The evidence is equally shaky (сомнительный) implicating consumption in pancreatic cancer or colon or rectal cancer. Moreover, contrary to common perception, there is no convincing evidence that drinking coffee increases the risk of breast cancer or that it promotes the formation of non-cancerous breast lumps (шишка). Some limited evidence has suggested that coffee may increase the risk of bladder cancer, but no one knows just how much coffee consumption should be considered a problem.

As for osteoporosis, it is not known if coffee drinking alone (apart from other habits, such as smoking) increases the risk of bone fracture. High levels of caffeine do seem to deplete the body's stores of calcium, and thus may promote bone loss. By consuming a glass of milk a day—or otherwise upping calcium intake—a woman who drinks coffee in moderation can easily counteract this effect.

DO YOU EAT THE RIGHT FOOD?

What do we mean by a well-balanced diet? This is a diet that contains daily servings from each of the basic food groups: meat, vegetable and fruit, milk, bread and cereals. There's no doubt that food tastes and preferences are established early in life. No one is born a "sugar freak" or a salt craver. An incredible statistic is that between 30 and 50% of all the calories eaten each day are consumed in the form of between-meal snacks. Unfortunately, the usual between-meal foods are low in nutritive value and too high in calories and refined sugar. Some excellent snacks that should always be available are plain-yoghurt, carrots, pieces of apple, cheese and natural fruit juice. Eating yoghurt as a snack food is far healthier and more nutritionally sound than eating so-called "junk" food, which is less nutritious and too high in sugar and calories. Salted peanuts seem to be the least popular snack today.

People who diet know that if they stick to a low-fat, high-fiber intake they will be able to eat well without putting on weight. Instead of going on crash diets they are learning to educate their stomachs by eating sensible food. They can still enjoy chocolates and cream cakes once a week or so, but they know they have to cut down their intake slightly the next day.

Research is indicating that "we are what we eat". Recent work shows that Italians, who tend to eat lots of fresh fruit and vegetables that contain vitamins C and E, have low levels of heart attacks. Scots, however, tend to have a diet that is high in animal fat and low in fiber. Heart disease is a widespread problem in Scotland.

Now, evidence shows that it is especially vitamins C and E, which control the probability of attacks of angina – the severe chest pains which are usually a warning of heart disease.

- 1). Have you ever tried dieting? What did it include?
- 2). Do you prefer "junk" food to home-cooked meals?

HEALTH, DIET, FITNESS

Many people in the world are overweight at present. Scientists say that we drink too much and exercise too little. People are ignorant about the hazards or benefits of what they eat and drink (the exercise they do or do not take). Scientists are convinced that people must change their eating habits to reduce the risk of heart diseases and cancer as well. They believe that what we eat is as significant as what we smoke. They suggest that may be a third of all cancers is caused by elements in our diet that we could easily modify. Many think, that cancer is a sinister¹ disease. In truth, it is a group of diseases that have one thing

in common-body cells breaking the rules off growth. All the rest is different. They have different causes, run different causes and respond differently to different kinds of treatment. The most important information about diet came from a study of the different cancers in different countries. Breast cancer and colon are major killers in western countries but are rare in poor developing countries. Japan has high rates of stomach cancer but low rates of breast and colon cancer. These differences seem to be linked to differences in diet.

Africans and Japanese who emigrate to the USA get cancers that are rare in their native countries and common in their adopted countries. Even Japanese living in Japan are now beginning to get a Western pattern of cancers as they adopt² an increasingly westernized diet. Neither the Eastern nor the Western diet is ideal, but scientists try to find out the elements in each diet that increase or decrease the risk of cancer. They now know enough about those elements in each diet that increase the risk of cancer.

Germany or the USA or other nations with high rates of myocardial infarction, for long time in the past, used to look with admiration to Asia as a model of healthy nutrition and low cholesterol levels. Cardiovascular diseases, myocardial infarction and stroke were almost non-existent in the Far East. In the meantime, tables seem to have been turned³ on Asia. Health awareness⁴ is growing in the West, with myocardial infarction rates declining in many counties, including the US, while growing numbers of Asians have been adopting the West's "bad habits". Traditional rice, vegetables and fish are increasingly replaced by pizza, Hamburger and other types of fast food. In Hong Kong, fast food has become so popular that health experts are warning the public against grave health repercussions⁵. Children and adolescents are particularly affected. Hong Kong children suffer from the second highest cholesterol levels worldwide, according to a recent study, and medical professionals have unambiguously suggested that this was attributable to change in eating habits. It is a deplorable consequence of alimentary sins that the number heart patients is strongly growing in the younger generation.

1. sinister ['sɪnɪstə] – гибельный, пагубный;
2. to adopt [ə'dɒpt] – принимать, выбирать;
3. to turn tables on (upon) smb. – поменяться ролями;
4. awareness – осведомленность, осознание;
5. grave health repercussions – серьезные последствия для здоровья.

TROUBLE WITH EATING

Last week Dolores O’Riordan, the lead singer of the Cranberries, had to cancel her tour of Europe apparently because of anorexia. Over 700,000 people in Britain suffer from the disease.

What is anorexia? Anorexia nervosa is an eating disorder, often described as the “slimmer’s disease’. While the name means nervous loss of appetite, this is misleading. Sufferers of anorexia have not lost their appetites but have lost the ability to let themselves eat food. They think about food, how they can resist eating and the way their body looks the whole time. Doctors define somebody as anorexic when they have lost at least 15 percent of their normal weight, have a fear of fatness and think they look fatter than they really are. Anorexia is not a diet gone wrong. Anorexics are people with serious problems.

What are the symptoms of the disease? Some of the symptoms are severe weight loss, difficulty in sleeping, dizziness, stomach ache, feeling cold, loss of energy, loss of periods, osteoporosis (thinning bones), stomach ulcers and growth of downy hair, feeling fat even though very thin, mood swings, exercising too much, feeling bad about yourself and losing friends. It is a horrible and sometimes fatal disease. One in 10 anorexics die of starvation or commit suicide.

What causes anorexia? The causes are complicated. Being overweight is not the cause. People with anorexia are expressing deep emotional problems. They stop eating to avoid dealing with these feelings or to try to keep them under control. Often there is no single cause of anorexia but it is triggered by a series of events which make life feel very hard. Some sufferers have family problems. Some have suffered a death of somebody special, others have school problems such as bullying, or have problems with friends. Some feel pressured, by exams or to succeed. Some lack confidence. One in 10 sufferers of anorexia have been sexually abused. Most feel worthless and powerless to change their life. Anorexia most often occurs during adolescence, the period when a child grows into an adult from about the age 12 until 17. This is a confusing and difficult time for everybody. Are pictures of skinny fashion models to blame? Although anorexia was not recognized as a disease until the 1970s, there are records of anorexic behaviour going back to the 11th century – long before magazines! However, more and more people seem to be suffering from the disease and society’s message that “skinny is beautiful” does not help. Children are young as eight are conscious of their body shape and have picked up the message that somebody who is thin is healthier, more attractive and “better” than some who is fat. Children get this message from the society they live in – from TV, friends and mostly from adults in their family, many of whom are probably on a diet to lose weight. Fashion models are the heroines of many teenage girls of normal weight who try to get impossibly thin so they too can be “beautiful”, popular

and have wonderful lives. Magazines and TV encourage dieting and being thin.

Can boys suffer from anorexia? Yes, one in 10 sufferers is a boy. Boys are more likely to become obsessed by exercising than girls, and boys sufferers may spend every moment of the day exercising to burn off calories.

Is there a cure? There is no pill which cures anorexia. Feeding a sufferer until they are of normal weight does not work. If this happens the sufferer will just go away and stop eating again because the original problems have not been solved.

In order to recover, sufferers need to accept and like themselves, and they need to work on the problems that have caused their anorexia. It is difficult for sufferers to get better on their own. They need help from a doctor or from the Eating Disorders Association (see details below). Some sufferers may need to go into hospital for a while, and they will need support from their family or friends. The sooner a person gets help, the quicker recovery will be. It is important to remember that it is possible to recover and not to give up hope.

VITAMIN C. THE ULTIMATE HEALTH INSURANCE

One discovery stands out in the last half of the 20th century: vitamin C is uniquely important to the health and well-being of humans.

Dr. Linus Pauling was the first to realize the crucial importance of the vitamin C in the maintenance of a healthy immune system. In 1970 he proposed that regular intake of vitamin C (ascorbic acid), in higher than the officially sanctioned by RDA (recommended daily allowance), could help prevent and shorten the duration of the common cold.

The medical establishment immediately voiced their strong opposition to this, but many believed Dr. Pauling. They began taking large amounts of this vitamin. Most people immediately noticed a great decrease in the frequency and severity of their colds.

Recent medical research has confirmed Dr. Pauling's original idea. Not only does a high vitamin C intake markedly reduce the severity of a cold, it also effectively prevents secondary viral or bacterial complications.

Vitamin C works by stimulating the immune system and protecting us against damage from the free radicals released by the body in its fight against the infection.

Optimum intake

Dr. Pauling recommended a vitamin C intake of 1,000 mg per day or more. The official RDA is only 60 mg. So how much do we really need?

To answerer this question it is crucial to realize that the RDA is not in any way based on what is required for optimum health.

YOGURT

Years ago, when some long-lived people of another culture were asked their longevity secret, they gave the credit to their daily meals of yogurt—hence the start of yogurt mania in developed countries. Since then, researchers have studied both yogurt and yogurt-eating people to try to detect whether yogurt has health-promoting qualities.

Yogurt is made from milk that has been fermented by the **Lactobacillus** bacteria group, so it is nutrition-ally equivalent to the same quantity of milk, except that some of the lactose has been fermented to lactic acid. (This makes it useful for some people with lactose intolerance.) It is rich in calcium, protein, and the other nutrients normally found in milk. Its high calcium content may help protect against cancer, for diets high in calcium seem to protect against cancer generally, especially that of the colon (large intestine).³² *Fermented* milk products (yogurt, buttermilk, kefir, and others) contain, in addition to nutrients, the bacteria from which they were made, and these bacteria, or products of their metabolism, seem to have additional special effects of their own. Specific strains of the yogurt-making bacteria produce enzymes that act against a number of transplanted and chemically induced cancers in animals, although exactly how they work is not yet known.³³

Groups of people who include yogurt as a staple food suffer less colon cancer than people who do not. This is so even if their diets are high enough in fat to be expected to promote a high cancer rate. The bacteria of yogurt are known to survive the digestion process and take up residence in the large intestine, so it seems logical to look to bacterial action in the colon for an explanation of yogurt's anticancer effect. Researchers studying the colon contents of yogurt-eating people have found that they contain fewer enzyme-produced carcinogens than the colons of other people. It seems that *Lactobacillus* bacteria growing in the intestine inhibit those intestinal enzymes that convert at least some food chemicals into carcinogens in the colon.³⁴ In a study of mice, intestinal tumors stopped growing when the mice ate yogurt, presenting another possibility—that the byproducts of bacterial growth inhibit tumor growth after it has begun.³⁵

This is not to say that these researchers have proven that yogurt can prevent cancer. Their findings must be followed by mire research, particularly research that uses the commercially available yogurt ordinarily consumed by people, to determine whether the products on the grocery store shelves have the

anticancer effect. Assuming, though, that the *Lactobacillus* bacteria do inhibit carcinogen production in the colon, how can consumers apply this information?

The bacterial strain present in yogurt takes up only temporary residence in the digestive tract. It must be included in the diet regularly (reintroduced periodically) to achieve any possible benefits. Also, the yogurt must contain live cultures³⁶ (some manufacturers provide this information on the label).

Two other products also deliver *Lactobacillus*: **acidophilus milk** and acidophilus tablets. *Lactobacillus acidophilus* bacteria are grown in a medium, then harvested and added to milk. The bacteria are not grown in the milk, where they would ferment the lactose, for if they did, they would produce a sour by-product—lactic acid. The lactose content of acidophilus milk is therefore the same as that of milk, but it provides the beneficial bacteria, together with a medium suitable for their growth within the digestive tract. Acidophilus tablets taken without a milk product do not supply the needed medium in which the bacteria can multiply, and so do not establish a large *Lactobacillus* colony in the intestine.

Other research has led to other claims for yogurt. For example, yogurt cultures fed to rats produce and secrete an antibiotic effective against *other* bacteria that might cause harm—such as the ones that cause food poisoning.³⁷ Although supported by some research, these claims were derived from research in animals. Like all such claims, they need further investigation before they can be applied to human health.

VI. PATHOLOGY. TREATMENT. DRUG ALCOHOL AND TOBACCO ADDICTION

ANESTHESIA

Anesthesia means total loss of sensation, but the term is often used to refer to any medications used to relieve pain during medical procedures. Some of these medications are indeed anesthetics in the sense that they do obliterate all feeling—either through complete loss of consciousness or by numbing a specific part of the body. Others are pain-relieving drugs called analgesics which are used to lessen pain while leaving some degree of sensation.

The degree to which alternative practices such as hypnosis or acupuncture can be used to produce effective pain relief without drugs is still under investigation in the West. Eastern practitioners have relied on these techniques for centuries.

With the exception of topical anesthetics (which relieve a limited surface area such as the gums), anesthesia must be administered by a licensed clinician—usually an anesthesiologist (a physician specializing in pain relief), an anesthetist (a specially trained nurse who works under the supervision of a physician), or a dentist.

Most of the time a surgeon will choose a form of anesthesia most appropriate to a particular procedure and to the patient's age and individual state of health.

► **Systemic analgesia**

Systemic analgesia involves using medications to relieve anxiety and tension throughout the body, thus reducing the intensity of pain while allowing the patient to remain conscious. Often morphine-like medications—such as the narcotic meperidine (Demerol)—are injected into a muscle or a vein during surgical procedures; they may also be given during childbirth, to “take the edge off” contractions, and during abortions. Other medications sometimes used for systemic pain relief are hydroxyzine (Vistaril), promethazine hydrochloride (Phenergan), and diazepam (Valium).

Although the patient can still feel pain with these drugs, she is generally so relaxed that she is much less likely to mind it. Depending on the dosage, she may drift in and out of alertness, so that time seems to pass unusually fast. Of course, depending on one's perspective, the same characteristics that allow sedation to work—particularly difficulty concentrating and drowsiness—can also be construed as potential side effects.

► **Local anesthesia**

Local anesthetics numb a confined area of the body such as the gums or the eye. A local anesthetic applied to the surface of the body to relieve a limited area is called a topical anesthetic. Many topical anesthetics—including mouthwashes, throat lozenges, cold sore relievers, and rectal suppositories—are available without a prescription. All other forms of local anesthesia are Novocain-type drugs and are administered by a clinician, usually by injection. Although local anesthesia is considered the safest form of pain relief, it can be used only for relatively short procedures, since its effects usually wear off after an hour or so. Occasionally, however, it may be used for more extensive procedures in patients whose age or health precludes using other forms of anesthesia.

► **Regional anesthesia**

Regional anesthesia blocks pain sensation in a specific region of the body, for example, from the waist down. It is sometimes called conduction anesthesia because the anesthetic blocks the conduction of pain impulses in select nerves. It may be used together with some form of sedation (administered intravenously), along with an infusion of a sugar and salt solution to prevent dehydration. Although the patient remains conscious—as with local anesthesia—regional anesthesia can be used for more extensive procedures because it provides deeper and longer-lasting pain relief. It is also sometimes used to provide continued relief after a procedure is over.

The main forms of regional anesthesia are spinal, epidural, caudal, and major nerve blocks. The first three are used for surgeries below the navel, including operations on the reproductive organs (such as a tubal ligation, hysterectomy, or dilatation and curettage (кюретаж, выскабливание)), bladder, rectum, legs, and hips—as well as during labor and delivery.

► **General anesthesia**

General anesthetics produce a complete loss of consciousness and are therefore often the anesthesia of choice for extensive and prolonged surgeries. They are administered by either inhalation or injection, often following the administration of a sedative medication. In some procedures drugs such as sodium pentothal or Diprivan may be injected to induce a quick state of light anesthesia before slower-acting drugs are administered via inhalation. In some longer operations a ventilation tube is placed through the mouth into the windpipe to facilitate breathing. Most people wake from general anesthesia feeling groggy (слабый), sometimes for many hours. For this reason, driving and other activities that require quick reflexes and good coordination should be avoided for about a day.

General anesthetics affect all parts of the body—including the brain, heart, and lungs. It is therefore standard procedure for vital signs—such as heart rate and rhythm, blood pressure, breathing, and temperature—to be monitored continually while a patient is under general anesthesia. Patients are also usually

carefully screened to make sure they do not have preexisting health conditions (such as hypertension, diabetes, heart or lung disease, or allergies to the anesthetic used) which would predispose (предрасполагать) them to complications (осложнения). Side effects (such as nausea, vomiting, muscle pain, or sore throat) are usually minor, temporary, and readily managed by the clinician overseeing the procedure. It is quite rare for serious complications (such as stroke (припадок, «удар»), heart attack, or respiratory arrest) to result. Women who think they might be pregnant should mention this possibility to their clinician before having any procedure that might require general anesthesia.

In rare instances patients under general anesthesia may choke (вызывать асфиксию) when food comes up from the stomach and enters the lungs or windpipe. This is why patients are told not to eat or drink for a number of hours before they have surgery, and is also why many clinicians advise women in labor to avoid solid food and water—on the chance that an emergency requiring general anesthesia may have to be performed.

DRUGS

In fact, all medicines are drugs. You take drugs for your headache or your asthma. But you need to remember that not all drugs are medicines. Alcohol is a drug, and nicotine is a drug. There are many drugs that do you no good at all.

There's nothing wrong with medicinal drugs if they're used properly. The trouble is, some people use them wrongly and make themselves ill. Most of the drugs are illegal, but some are ordinary medical substances that people use in the wrong way.

People take drugs because they think they make them feel better. Young people are often introduced to drug-taking by their friends.

Many users take drugs to escape from a life that may seem too hard to bear. Drugs may seem the only answer, but they are no answer at all. They simply make the problem worse.

Depending on the type and strength of the drug, all drug-abusers are in danger of developing side effects. Drugs can bring on confusion and frightening hallucinations and cause unbalanced emotions or more serious mental disorders.

First-time heroin users are sometimes violently sick. Cocaine, even in small amounts, can cause sudden death in some young people, due to heartbeat irregularities. Children born to drug-addicted parents can be badly affected.

Regular users may become constipated and girls can miss their periods. Some drugs can slow, even stop the breathing process, and if someone overdoses accidentally they may become unconscious or even die.

People who start taking drugs are unlikely to do so for long without being found out. Symptoms of even light drug use are drowsiness, moodiness, loss of appetite and, almost inevitably, a high level of deceit.

First there's the evidence to hide, but second, drugs are expensive and few young people are able to find the money they need from their allowance alone. Almost inevitably, needing money to pay for drugs leads to crime.

ENVIRONMENTAL FACTORS IN DISEASE

Chemical contamination may occur in one's own special environment, or it may occur in the environment we share with our community, that is to say, our environment at large. Public attention is largely focused on the air and water "at large" but from the standpoint of health it is probably one's own special environment that is of the greater importance. There are two reasons for this: (1) the introduction of potentially harmful chemicals occurs more often in the workplace, in the home, or in an enclosed vehicle than in the environment at large. (2) In the enclosed environments much higher concentrations of toxic materials can occur and persist.

When a particular chemical can be identified as a threat to health, its dangers can be neutralized in some way. It is the initial identification that may be quite difficult, for the health damage produced by a particular chemical may take the form of a well known disease – asthma or primary carcinoma of the liver, to mention two actual examples. Because the disease is well characterized and known to occur in many geographic areas, there seems little sense in suspecting that it might be related to some identifiable element in the environment.

Like so many problems in medicine today, the one presented by chemical contamination of our air and water is only partly medical. The forces that expose the individual to the contaminants are technologic, economic or cultural.

GOOD DAYS, BAD DAYS

At the beginning of this century medical scientists made a surprising discovery that we are built not just of flesh and blood and also of time. They were able to demonstrate that we all have an internal body clock, which regulates the rise and fall of our body energies, making us different from one day to the next. These

forces became known as biorhythms; they create the “highs” and “lows” in our everyday life.

The idea of an internal “body clock” should not be too surprising, since the lives of most living things are dominated by the 24-hour night-and-day cycle. The most obvious feature of this cycle is the way we feel tired and fall asleep at night and become awake and alert during the day. If the 24-hour rhythm is interrupted, most people experience unpleasant side effects. For example, international aero plane travelers often experience “jet lag” when traveling across time zones. People who are not used to shift work can find that lack of sleep affects their work performance.

As well as the daily rhythm of sleeping and walking, we also have other rather rhythms which last longer than one day which influence wide areas of our lives. Most of us would agree that we feel good on some days and not so good on others. Some times we are all fingers and thumbs but on other days we have excellent coordination. There are times when we appear to be accident-prone, or when our temper seems to be on a short fuse. Isn't it also strange how ideas seem to flow on some days but at other times are apparently non-existent? Musicians, painters and writers often talk about “dry spells”.

Scientists have identified the following three biorhythmic cycles: physical, emotional and intellectual. Each cycle lasts approximately 28 days and each is divided into a high energy period and a low energy period of equal length. During the high energy period of a physical biorhythm we are more resistant to illness, less well coordinated and tire more easily. The low period puts energy in our “batteries” for the next high period.

The “critical” or weakest time is the time of changeover from the high energy period to the low energy period, or vice versa. The critical time usually lasts a day. On a critical day on a physical biorhythm, there is a greater chance of accident or illness.

Human experience is always individual and we each have our own biorhythmic experiences. Some people experience such enormous physical turbulence on their “physical critical” days that they have to go to bed. Accidents appear to happen so frequently during turbulent biorhythms that some car insurance companies in Japan have issued biorhythm policies to policyholders in order to cut down the number of costly accidents.

INFECTIOUS MONONUCLEOSIS

In addition to its association with Burkitt lymphoma, the Epstein-Barr virus causes infectious mononucleosis. EB virus is classified as a herpesvirus. Burkitt lymphoma and infectious mononucleosis are very different

manifestations of infections with EB, and there doesn't appear to be any increase in the incidence of malignancy in individuals who contract infectious mononucleosis. The EB virus occurs in oropharyngeal secretions of infected individuals and appears to be transmitted primarily by direct and indirect exchange of oropharyngeal secretions.

Infectious mononucleosis most commonly occurs in young adults 15 to 25 years of age. This fact is probably due to the exchange of saliva during kissing, a prevalent activity often involving more partners for this age group than others. From the mouth, B cells and monocytes in the tonsils or adenoids are infected. The virus is carried from there via circulating B cells and monocytes to other lymphoid tissues such as the cervical lymph nodes and spleen. Once it establishes an infection, the EB virus normally remains within the body indefinitely. Up to 90% of the people in the United States have antibodies, indicating a prior infection with the EB virus. In the cause of infectious mononucleosis, mononuclear white blood cells are affected, leading to characteristic changes in the white blood cells – including a change in the appearance of the nucleus – that are diagnostic of this disease.

The symptoms of infectious mononucleosis include a sore throat, low-grade fever that generally peaks in the early evening, enlarged and tender lymph nodes, general tiredness and weakness. The liver and spleen may also be affected by this condition. In most cases of infectious mononucleosis the symptoms are relatively mild and the acute stage of the illness lasts less than 3 weeks. In young children, for example, infectious mononucleosis often is very mild or asymptomatic. Treatment is supportive for the symptoms of sore throat, low-grade fever, enlarged and tender lymph nodes, fatigue and weakness.

Infectious mononucleosis, caused by the Epstein-Barr virus, is characterized by swollen lymph nodes, low-grade fever and fatigue.

KNOWING DANGERS

NICOTINE is a tremendously powerful drug. It can produce both awareness and relaxation. It is easily accessible and relatively inexpensive. Along with these pleasurable properties, nicotine and its fellow components in cigarettes, smokeless tobacco, cigars, and pipes have toxic, often harmful effects upon the human body. The ways in which these substances influence bodily function and their long-term consequences are the focus of this chapter.

PHYSIOLOGY

Cigarette smoke contains hundreds of chemical substances. Three of the most damaging of these are nicotine, **tar**, and **carbon monoxide**. Nicotine is found in the root of the tobacco plant. When it is fresh, it is a colorless oil; it turns brown

when exposed to air. Tar results from **organic** matter burned in the presence of air and water at a sufficiently high temperature. Because it requires such a high temperature, it is not present either in unburned tobacco or in chewing tobacco or snuff. Carbon monoxide is a gas produced by burning material. The amount of carbon monoxide increases in places where little oxygen is present—the motor of an automobile, the workings of a gas stove, and the inside of a cigarette.

Nicotine

Pharmacologically, nicotine is categorized as a **stimulant** because it provokes **nerve cells** in the brain and heightens awareness. Its effects are so complex, however, that no one classification is completely accurate. For example, nicotine stimulates certain nerves in the spinal cord known as Renshaw cells. This effect, in turn, relaxes many nerves in the body and slows down certain reactions, such as knee reflexes. The drug's effects also depend on the amount in the body. For example, some nerve cells are stimulated by a small amount of nicotine but depressed by large amounts of the drug.

One can ingest nicotine by smoking (cigarettes), chewing (chewing tobacco), or inhaling (snuff). Chewed or inhaled nicotine enters the **circulatory system** through the **mucosae** (thin skin) of the nose or mouth. It then travels through **capillaries** contained in the mucosae to the bloodstream, which in turn carries it to the brain. When it is smoked, nicotine goes through the **alveoli** (air cells) of the lungs into the arterial bloodstream, which carries it directly to the brain. The entire process takes less than 10 seconds.

Once in the brain, nicotine stimulates neurons by imitating the behavior of a **hormone** called **epinephrine** (adrenaline) and **acetylcholine**, a **neurotransmitter**. A person's body naturally releases epinephrine when he or she is anxious or under stress. Scientists believe that acetylcholine may play a major role in the nerve centers for thought and higher mental functions (some research indicates that some of the symptoms of **Alzheimer's disease**, a progressive illness marked by severe loss of memory, may be caused by a depletion of neurons that use acetylcholine). [1] At the same time that nicotine mimics these two chemicals, which heighten awareness, it triggers the release of **endorphins**, the brain's natural opiates, which produce a calming effect. As a result, many smokers experience a simultaneous feeling of excitement and relaxation while nicotine is in their bloodstreams.

Tar

Tar is one of the most dangerous components of cigarette smoke. When a person inhales from a burning cigarette, tar contained in the smoke fills the alveoli of the lungs. Over time this effect can lead to respiratory problems, such as bronchitis and emphysema, as well as contributing to the development of lung cancer. Cigarette companies are aware of these dangers and have lessened the amount of tar in some of their brands. This action has been mildly successful,

but because tar is so integral to both the flavor and satisfaction of a cigarette, some smokers either avoid low-tar brands completely or, when they use them, inhale so deeply that they ingest almost as much tar-and more of other hazardous chemicals-as when they smoke their regular brand. This defeats the purpose of using a low-tar brand in the first place.

Carbon Monoxide

Carbon monoxide (CO) is chemically similar to **carbon dioxide** (CO₂). Produced by normal body processes, carbon dioxide travels through the lung alveoli into the bloodstream, where it bonds with **hemoglobin** to form **carboxyhemoglobin** (COHb). Hemoglobin is the blood component that removes carbon dioxide from the body and carries oxygen into the body. Carbon monoxide also arrives in the bloodstream through the alveoli, and like carbon dioxide it then bonds with hemoglobin. But carbon monoxide bonds much more tightly and, therefore, leaves the body much more slowly. In the meantime, the blood accumulates much higher amounts of carbon monoxide. This action can slowly starve the body of oxygen. An insufficient amount of oxygen can affect heart functioning; in extreme cases it can cause a heart attack.

According to studies, people who smoke one pack per day have carbon monoxide levels in their bloodstreams of 25 to 35 parts per million blood components. However, even these “moderate” smokers may have levels of 100 p.p.m. for short periods of time. In general, levels of carbon monoxide in the blood of smokers are 4 times higher for moderate smokers than for nonsmokers and often as much as 15 times higher for heavy smokers.

Other Components

Researchers have devised cigarette-smoking machines to collect and study cigarette smoke, which is composed of both gases and solids. Cigarette smoke contains more than 4,000 substances. The machine can separate the gas and solid phases through a filter, which traps particles larger than one micrometer and stores the rest (gas) in a special tank. These machines are designed to smoke a cigarette the way a typical smoker would.

During a puff, the tip of the cigarette’s burning end reaches a temperature of nearly 2,000 degrees Fahrenheit. This tiny furnace activates the organic (leaves, paper, sugar, nicotine) and inorganic (water, tar, metal, radioactive elements) materials. The cigarette filter and paper act to filter **mainstream smoke** before the smoker inhales it. The cigarette does not filter **side stream smoke**, which escapes from the tip of the cigarette; this smoke results from a slightly cooler burning process than does mainstream smoke, so that the tobacco it contains has not burned completely, and the smoke is filled with more unburned particles. This side stream smoke is hazardous not only to actual smokers but to passive smokers as well.

IS THERE A HEALTHY OBESITY?

Obesity defined as a mass index above 30 kg/m^2 has been shown in prospective studies such as the Framingham Study, the American Cancer Society Study and the Scandinavia studies to be associated with an increased mortality due to cardiovascular diseases, diabetes mellitus, gallbladder diseases and cancer of various organs. Obesity and morbidity are linked by hypertension, pulmonary function disturbances as well as gallbladder diseases and diabetes. On the other hand, social epidemiological facts indicate that genetic and lifestyle factors are involved in the etiology of obesity. Of the cultural influences, changes in diet link obesity to modernization, i.e. westernization. Thus, the prevalence of obesity in the traditional Polynesian island of Pukapuka is 15%, in the rapidly modernizing island of Rarotonga 29% and for the urban Maoris 35%. Nevertheless, in many non-industrialized countries around the world obesity is associated with social class and ethnicity. The relationship between the two is often a positive one, indicating that the obese person is rich, strong and mighty. Societies favouring plumpness as a standard of beauty are spread over all of the major culture areas except Asia.

Thus, one may speculate that there is a “healthy obesity” in non-industrialized nations which is different from the obesity found in the industrialized nations. This view was supported by two mediconutritional surveys performed in the Kingdom of Tonga since 1977. Here, the natives are obese and consume a relatively low salt diet. They obey their traditional lifestyle and customs. In an investigation by Sawata et al. (1988) 102 male Tongans were studied in regard to age, body height, body weight, degree of obesity, total cholesterol, systolic and diastolic blood pressure as well as skin folds. Their data were compared with those obtained from Japanese subjects working in a Tokyo trading firm. Although the Tongans (T) were much more obese than the Japanese (J), their diastolic blood pressure was lower (77 mmHg T/81 mmHg J), their systolic blood pressure somewhat higher (130 mmHg T/124 mmHg J).

The serum total cholesterol concentration was not significantly correlated with the degree of obesity in the Tongans but it was in the Japanese. Incomplete right bundle branch block was more frequently seen in the Tongans than in the Japanese. The reason for this observation is unclear.

Although these data have to be considered cautiously they may indicate that a “healthy obesity” exists if ethnic differences and differences in lifestyle, customs, nutrition and fitness are taken into account and excessive obesity and cardiovascular risk factors are avoided.

SUBSTANCE ABUSE

Substance abuse involves the use of drugs or other chemicals to the point where physical, psychological, or social functioning is impaired. Although the term is often associated with the use of illegal drugs such as marijuana and cocaine, it can also mean excessive reliance on legal substances such as alcohol or nicotine, prescription medication medications such as minor tranquilizers, painkillers, and diet pills are much more commonly abused by women than is either alcohol or street drugs.

► **Abuse of illegal drugs**

A national household survey by the National Institute on Drug Abuse showed that about 5 percent of all women—in contrast to 8 percent of all men—report regularly using illegal drugs. The highest prevalence of use was reported in women of childbearing age, 8 percent of whom have used illegal drugs, marijuana being the most common. An estimated 3 to 17 percent of pregnant women use cocaine.

Higher than average levels of use are reported among women who live in the inner city or who have criminal records, as well as among lesbians and women in the military. It should be pointed out, however, that these are women who (unlike middle-class homemakers) are at greatest risk of being “caught” abusing drugs. In some inner cities more women than men use crack, a highly purified and fast-acting form of cocaine. Women with college degrees are likely to use cocaine than are those with only high school degrees.

The risk of acquiring a sexually transmitted disease, including acquired immune deficiency syndrome (AIDS), is increased in women who abuse illegal substances. Intravenous drug abuse has been involved in 80 percent of the AIDS cases that have occurred in women. Although occasionally women acquire AIDS through direct infection by a contaminated needle, most of the cases occur because women under the influence of drugs or alcohol tend to engage in risky sexual behaviors—including sex with a male IV drug user infected with the AIDS virus. Some investigators have linked the recent rise in the incidence of syphilis to the use of cocaine and other drugs.

Abuse of opiates, cocaine, and some other illegal substances can produce various forms of sexual dysfunction. Despite the common perception that certain drugs such as cocaine, heroin, or amphetamines (uppers or pep pills) can enhance sexual functioning, chronic use of these drugs can inhibit orgasms and decrease sexual desire (libido). Dependence on heroin can also suppress ovulation (the monthly release of an egg from an ovary). Although menstrual periods often return to normal after a few months of maintenance treatment with methadone (a substitute narcotic used to treat heroin addiction), methadone itself depresses sexual interest and response. Some tests indicate that marijuana use may also cause irregular menstrual cycles and a temporary loss of fertility.

Using cocaine while pregnant increases the risk of certain complications of pregnancy, including placenta previa (a condition in which the placenta covers the cervix and is prone to bleeding), placenta abruption (a condition in which the placenta abruptly separates from the endometrium), intrauterine growth retardation, premature labor, and stillbirth. There is evidence linking cocaine use during pregnancy to numerous birth defects, including neural tube defects and malformations of the genitourinary, gastrointestinal, and cardiovascular systems of the fetus. The effect of cocaine on the neuropsychological development of children is less clear because studies so far have not ruled out nutritional, social, or other factors that might explain these developments.

One dangerous myth about cocaine use during late pregnancy has led some young women to use this drug in the hope that it will shorten their labor and make it less painful. This false belief stems from cocaine's stimulant and vasoconstrictive properties. Rather than facilitating labor, these properties have been linked to sudden death in pregnant women and to premature rupture of membranes, premature labor, and fetal distress.

TOBACCO AND PREGNANCY

LOW BIRTH WEIGHT

Cigarette smoking during pregnancy can cause **premature birth**, low birth weight, shorter body length, breathing difficulties at birth, behavioral and learning problems, and **hyperactivity**. The most frequent of these defects is low birth weight. This occurs when the fetus's growth and development within the mother's uterus is slowed or retarded, a condition known as **intrauterine growth retardation (IUGR)**. IUGR results when the flow of oxygen and nutrients to the fetus is cut off or interfered with. Hundreds of scientific surveys have studied the link between cigarette smoking and low birth weight. One of these reports surveyed 127,000 American women who became mothers between 1979 and 1985 and found that babies of women who smoked more than a pack of cigarettes a day during pregnancy were an average of 11.7 ounces¹ lighter than the children of women who did not smoke. Five studies concerning 113,000 births in the United States, Canada, and Wales found that mothers who smoke lightly to moderately were 50 percent more likely – and those who smoke heavily twice as likely – to have babies weighing less than 5 pounds².

Low birth weight can also cause a host of other problems. For example, it can increase the child's risk of suffering physical and mental defects, illnesses, learning disabilities, and behavioral problems. It can also lower the child's survival rate: the lower the child's weight at birth, the lower his or her chances of survival. The average weight of a newborn is between 7 and 9 pounds. Babies

who weigh less than 5.8 pounds have a significant risk of dying. Those weighing 3.5 pounds or less are in very grave danger indeed.

NOTES:

1. ounces – 28,35 gram(me)s;
2. pounds – 453,59 gram(me)s.

PREMATURE BIRTH

Smoking increases the likelihood of vaginal bleeding during pregnancy, which can in turn lead to premature birth. Even if bleeding does not occur, studies show that premature birth occurs 10 percent more frequently among moderate smokers and 20 percent more frequently among heavy smokers than among nonsmokers. Premature babies not only are underweight but can suffer a host of problems, such as underdevelopment of the respiratory tract, nervous system, muscles, and other organs. Cigarettes also increase a woman's risk of suffering a **miscarriage** or stillbirth or of the child dying during his or her first weeks of life. According to studies, smokers have a 30 to 70 percent greater chance of suffering a miscarriage than nonsmokers, depending in part on the number of cigarettes smoked each day. One study found that smoking a pack a day or more virtually doubled the risk of miscarriage. Smoking also increases the rate of stillbirths, particularly among women who are receiving poor prenatal care because of socioeconomic factors, such as poverty or lack of education.

RESPIRATORY INFECTIONS AND OTHER ILLNESSES

Children of smokers are especially susceptible to certain health ailments. Earlier we saw that passive smoking increases a child's susceptibility to respiratory infection. The same holds true for the children of mothers who smoked during pregnancy even if they have quit since giving birth. Several studies have shown that these babies have more illnesses before the age of 5 than do the children of nonsmokers. They have a significantly higher frequency of colds, for example, which can in turn lead to more serious problems, such as lung and ear infections. Researchers have also found that the babies of smokers suffer a higher rate of bronchitis and pneumonia during their first year of life.

The risk of illness is not limited to the respiratory system. There is evidence that the babies of mothers who smoked during pregnancy are as much as 50 percent more likely to suffer childhood cancers such as **leukemia** than the children of nonsmoking mothers. Many studies have found that these babies have an increased likelihood of suffering behavioral problems, such as hyperactivity. This disorder is characterized by excitability, concentration problems, and over activity.

CONGENITAL DEFORMITIES

It has not been definitively proven that cigarette smoking during pregnancy can cause **congenital deformities**, but some studies have found that children of mothers who smoke may have a higher frequency of heart malformations, abnormally small jaws and mouths, and upturned noses than those of nonsmokers. Several studies have found that smoking mothers who also take tranquilizers have a decidedly higher risk of bearing a deformed child than do mothers who do not take any drugs. Scientists are continuing to conduct surveys of smoking mothers to determine more conclusively if there is a link between smoking and congenital malformations.

CHEMICALS THAT CROSS THE PLACENTA

Scientists have studied not only the ways cigarette smoking can damage an unborn child, but the reasons these problems occur. The chemical makeup of cigarette smoke is comprised of nearly 4,000 different compounds, such as nicotine and carbon monoxide. It also contains some heavy metals, such as cadmium and lead.

These two elements enter the blood every time a cigarette smoker inhales, and they can cause grave damage to the **placenta**. In animal studies, even low doses of cadmium resulted in low birth weights. In these same animal studies, at high concentrations cadmium caused miscarriages, stillbirths, and malformed offspring. Lead can interfere with the fetus's enzyme systems; studies show that babies born to smoking mothers have a significantly reduced enzyme activity compared to those of nonsmokers.

Cyanide from cigarette smoke also travels to the blood-stream. The body's metabolic process quickly converts this chemical to **thiocyanate**, a substance that is normally present in the human body in minute quantities from the foods we eat. But cyanide and thiocyanate are both toxic compounds and at higher levels can reduce the ability of cells to use oxygen, interfere with the body's ability to process vitamin B₁₂, and damage brain cells. Many scientists believe that thiocyanate is a significant cause of low birth weight babies among smokers.

Nicotine and carbon monoxide are the two most studied chemicals in cigarette smoke. Both cross the placenta. Nicotine causes blood vessels to narrow, including those that carry blood through the placenta. As a result, blood flow to the placenta is reduced, lessening the organ's ability to supply nutrients to the unborn child. Carboxyhemoglobin forms when carbon monoxide bonds to hemoglobin. The blood of a smoker contains 4 to 5 times the amount of this compound as does that of a nonsmoker, and the level of carboxyhemoglobin in the fetus runs 10 percent to 20 percent higher than in its mother. The presence of

carboxyhemoglobin interferes with the flow of oxygen and nutrients to the fetus, which we know is a major cause of IUGR and low birth weight.

VIRAL DISEASES OF THE RESPIRATORY TRACT

Several viruses can infect and cause diseases of the respiratory tract. Perhaps 50% of respiratory infections are caused by viruses. Airborne transmission from person to person is probably the most important root of spread for most viruses causing respiratory tract diseases. Viruses released into the air from an infected individual are transported as aerosols such as those formed by sneezing and coughing. When virus-containing aerosols are inhaled the respiratory tract is exposed to numerous viruses.

The viruses that cause respiratory tract infections such as the viruses that cause influenza, rhinoviruses that cause the common cold and respiratory syncytial viruses that cause pneumonia are generally limited to the respiratory tract.

In most cases the viruses establish localized infections that cause tissue damage with resultant disease symptoms.

THE COMMON COLD

The common cold is the name given to a cluster of diseases characterized by similar symptoms. Colds occur when certain viruses infect the cells lining the nasal passages and pharynx. Such viral infections from the upper respiratory tract produce an inflammatory response and tissue damage in the infected regions. Many different viruses can cause this disease. Some 90 immunologically distinct rhinoviruses are responsible for 25% of colds in adults and 10% of colds in children. Other viruses that cause colds include adenoviruses and coronaviruses. Hence, it is not surprising that immunity does not offer continuous protection against all of these different viruses. A variety of viruses, including various rhinoviruses, cause the common cold. As with many other respiratory diseases, colds occur primarily during the winter months. This may in part be due to the physiological stress posed by exposure to cold temperatures and the excessive drying of mucous membranes in heated buildings with low humidity. It may also be a consequence of increase contact between individuals during indoor winter activities that permits transmission of viruses through the air from an infected individual to a susceptible one. In the United States alone, more than 200 million work and school days are lost each year because of colds.

The symptoms of the common cold are the result of a localized inflammation in the upper respiratory tract. This inflammation causes the release of mucous secretions and is generally accompanied by sneezing and sometimes coughing. Symptoms during the course of the common cold include nasal

stuffiness, sneezing, coughing, headache, malaise (a vague feeling of discomfort), sore throat and sometimes a slight fever. There are various cold remedies that can alleviate the symptoms of a cold, but there is no specific cure for a cold. Fortunately, the common cold is a self-limiting syndrome, with recovery usually occurring within one week as a result of a natural immune defense response.

Influenza

The influenza viruses which are members of the orthomyxoviruses, are commonly referred to as the flu viruses. They cause a disease of the respiratory tract called influenza or flu. Influenza is characterized by the sudden onset of a fever, with temperatures abruptly reaching 102° to 104° F approximately 1 to 3 days after actual exposure and onset of infection. The development of this disease is further characterized by malaise, headache and muscle ache. In uncomplicated cases of influenza, the viral infection is self-limiting and recovery occurs within a week. However, infection with influenza virus can be serious and debilitating diseases. Complications such as bacterial pneumonia are prevalent among the elderly and individuals with compromised host defense responses following influenza infections. Such individuals should be immunized against the prevalent strains of influenza virus before the outbreak of influenza epidemics because these complications can result in death. Influenza, which can be a serious infection of the respiratory tract, is caused by influenza viruses. Influenza is transmitted by inhalation of droplets containing flue viruses. Droplets are released into the air by sneezes and coughs from the respiratory tracts of infected individuals. Outbreaks of influenza spread worldwide via airborne transmission from the site of an initial outbreak with a new strain, and it is possible to track the disease as it spreads from one area to another. Each year epidemiologists make predictions about the severity of influenza outbreaks, and public health officials take the necessary steps to immunize high-risk individuals and warn the general public about the dangers of this disease. There have been several major, or pandemic outbreaks of influenza during the 19 and 20th centuries that have occurred when a sufficient proportion of the population was susceptible to a particular strain of influenza virus. Major outbreaks of influenza are associated with the evolution of new strains of influenza viruses.

Major outbreaks caused by type A influenza virus occur every 2 to 4 years, those caused by type B influenza virus every 4 to 6 years; type C influenza virus normally infects animals – it really infect humans and causes mild cases of influenza.

Primary control of influenza is achieved by vaccinating individuals who are prone to the complications resulting from this disease, leaving others unprotected to suffer periodically from influenza. Vaccination against one type of influenza virus doesn't make one resistant to infection with an antigenically different strain of this virus. Vaccination is recommended for anyone over 65, those with chronic illnesses such as heart disease, lung disease, and diabetes,

and for healthy individuals who perform essential services, such as medical personnel. Vaccination is important because influenza causes a significant number of deaths. For example, the death rate in the US due to influenza in 1980 (a nonepidemic year) was 0,3 deaths per 100.000 population.

VIRUSES AND VACCINES

A virus is a nucleic acid molecule (DNA or RNA) with a protein coating. Almost from the beginning, scientists regarded viruses as falling at the edge of living matter. Unlike bacteria, viruses are unable to reproduce without entering another living cell. Since they invade body cells, it is difficult to attack and cure them.

In 1892, Dmitri Ivanovsky (Russian, 1864-1920) showed for the first time that viruses existed. Later that year, tobacco mosaic disease was attributed to a virus too small to see. Subsequently, the tobacco mosaic virus became the first example of a virus to be isolated as a pure crystalline solid when Wendell Stanley (American, 1904-1971) did so in 1935. A year later, Stanley isolated the viral nucleic acids that caused the disease. He shared the 1946 Nobel Prize in chemistry for this research.

In the meantime, other scientists identified several viruses and viral diseases. In 1898, foot and mouth disease became the first identified example of an animal viral disease. Many additional viruses and related diseases (such as polio, measles, small pox, and influenza) were uncovered later.

As scientists discovered viruses, they also learned how they function. Once a virus invades a cell, its genetic material (DNA or RNA) commandeers some of the cell's functions and causes the cell to produce new chains of viral nucleic acid. Each of these nucleic acids then acquires a protein coat and exits the cell as a virus. The new virus enters other cells and the viral production process continues.

Although doctors are unable to cure viral diseases, they can treat the symptoms and they can prevent an individual from contracting certain viral diseases through vaccines. A **vaccine** is a preventative medicine derived from a modified bacteria or from a virus rendered nonvirulent. Vaccines develop immunity to a specific disease.

Edward Jenner (English 1749-1823) developed the first vaccine in 1796. Jenner observed that milkmaids who had had cowpox seemed to have developed some immunity against smallpox, an especially virulent disease that killed many thousand each year. Jenner isolated fluid from cowpox pustules (blisters) and inoculated some people who were at great risk for smallpox with the fluid. (*Vaccinia* was the technical name for cowpox, hence the term *vaccine* for this fluid.) The cowpox disease was similar to smallpox but not as deadly.

Although the Royal Society rejected Jenner's new vaccine in 1797, this was only a temporary setback. The smallpox vaccine was first used in the United States in 1800. The vaccine eventually led to the total eradication of this viral disease; the last recorded case of smallpox occurred in Somalia in 1979.

The last reported case of smallpox in the United States occurred in 1949. Polio disappeared even more swiftly: in 1955, the year the polio vaccine was introduced, and the last reported case was in 1983. The World Health Organization (WHO) expects polio to join smallpox as an eradicated disease by 2005. Similarly, cholera, diphtheria, and tetanus are extremely rare. Whooping cough, measles, German measles, and mumps are now under control in the United States, although most of them killed or crippled many children as recently as forty years ago.

In March 1995, a new vaccine was introduced to prevent chicken pox.

With this new vaccine, the incidence of chicken pox is expected to decrease dramatically. As an added benefit, scientists believe this vaccine may also prevent shingles, a painful disease of the nervous system that the chicken pox virus produces in adults.

At this time, no one knows how to create a vaccine for a retrovirus such as HIV. AIDS remains a fatal viral disease with no cure or preventative on the horizon. Only a handful of chemical agents work against any virus; doctors ordinarily treat the symptoms and depend on the body's immune system to overcome the virus. With AIDS, this approach is doomed to failure because HIV destroys the T-cells in the human immune system, rendering the system inoperative. The battle against cancer (sometimes virus induced) has not yet won after spending billions of dollars and decades of research. At present, it appears that the battle against AIDS will also be long and hard-fought.

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лечебного факультетов и магистрантов**

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