МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА
И ПРОДОВОЛЬСТВИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

ГЛАВНОЕ УПРАВЛЕНИЕ ОБРАЗОВАНИЯ,
НАУКИ И КАДРОВОЙ ПОЛИТИКИ

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«БЕЛОРУССКАЯ ГОСУДАРСТВЕННАЯ
ОРДЕНОВ ОКТЯБРЬСКОЙ РЕВОЛЮЦИИ
И ТРУДОВОГО КРАСНОГО ЗНАМЕНИ
СЕЛЬСКОХОЗЯЙСТВЕННАЯ АКАДЕМИЯ»

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АНГЛИЙСКИЙ ЯЗЫК

BIOGRAPHY OF A SCIENTIST

Пособие по обучению чтению и говорению
для студентов УО БГСХА, обучающихся на II ступени
высшего образования по всем специальностям

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Пособие имеет своей целью совершенствование лексических навыков чтения и говорения. В пособие включены короткие биографии ученых, внесших вклад в развитие сельского хозяйства. Каждый текст снабжен упражнениями, направленными на активизацию лексики, необходимой для пересказа биографии ученого и построения собственного высказывания о научной карьере.

Для студентов УО БГСХА, обучающихся на II ступени высшего образования по всем специальностям.

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ВВЕДЕНИЕ

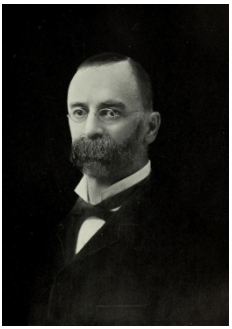
Настоящее пособие предназначено для занятий по английскому языку с магистрантами всех специальностей аграрного вуза, хотя может использоваться при работе со студентами младших курсов. Пособие подготовлено на материале биографий ученых, внесших вклад в развитие сельского хозяйства. Тексты учебного пособия подобраны с точки зрения их лингвострановедческого потенциала, а также с учетом профессиональных интересов студентов и магистрантов. Цель пособия – помочь студентам усвоить лексику и специальные обороты, знание которых необходимо для составления монологического высказывания о научной работе.

Пособие состоит из двух частей. Первая часть включает двенадцать уроков, в каждом из которых содержатся краткая биография ученого и задания к тексту. Послетекстовые упражнения направлены на проверку понимания прочитанного, активизацию лексики урока и развитие речевых навыков. Так как упражнения каждого урока построены на основе лексического и грамматического материала текстов, это позволяет основательно проработать изучаемые слова и конструкции и затем пересказать биографию ученого.

Во второй части пособия приводятся примеры текстов, показывающих магистрантам, как может выглядеть их высказывание о научной работе, а также перечень вопросов, которые помогут при составлении монологического высказывания о своей научной деятельности. Таким образом, материалы пособия позволят магистрантам лучше подготовиться к кандидатскому экзамену по английскому языку.

UNIT 1

Stephen Moulton Babcock
(1843–1931)
American Agricultural Chemist



1. A farmer's son from New York State[1], Babcock gained his B.A. degree from Tufts College[2], Massachusetts[3], in 1866 and after a period of farming became a chemistry assistant and (from 1875) instructor at Cornell University[4]. In 1879 he gained his doctorate under Hans Hübner[5] at Göttingen, Germany. After a further spell at Cornell on his return, he became chemist at the New York Agricultural Station in 1882, where he worked on the analysis of milk.

2. In 1888 Babcock became professor of agricultural chemistry at the University of Wisconsin[6]. Here, in 1890, he devised an efficient test (the *Babcock test*[7]), which quickly became standard, for measuring the butterfat content of milk. Studies followed on rennet, fermentation, metabolic water, and animal nutrition. In 1907 Babcock's associates began studies in which cattle were fed balanced diets derived from a single source – corn, wheat, or oats. The results obtained provided further evidence for the existence of accessory food factors and Babcock's school played an important part in the vitamin studies that followed.

NOTES

[1] **New York State** – штат Нью-Йорк

[2] **Tufts College** – религиозный Колледж Тафтса (сейчас – Университет Тафтса), основан в 1852 г. и назван в честь Чарльза Тафтса, пожертвовавшего свои земли под создание учебного заведения

[3] **Massachusetts** [ˊmæsəˊʧu:sits] – штат Массачусетс

[4] **Cornell University** – Корнелльский университет в Итаке, штат Нью-Йорк, один из крупнейших и известнейших университетов США. Был основан в 1865 г. Эзрой Корнеллом, бизнесменом и одним из создателей телеграфной индустрии

[5] **Hans Hübner** – Ганс Хюбнер (1837–1884), немецкий химик, доктор наук, профессор Геттингенского университета

[6] **University of Wisconsin** [wis´kɔnsin] – университет штата Висконсин в Мадисоне

[7] **Babcock test** – определение жира в молочных продуктах методом Бабкока; проба Бабкока (исследование молока на содержание жира); способ определения жира в молочных продуктах

Some Useful Vocabulary

associate [ə´səʊʃieit] – коллега, партнер, единомышленник

butterfat content of milk – содержание молочного жира в молоке, жирномолочность

derive from – получать из; разрабатывать на основе (чего)

devise [di´vaiz] – задумать, изобрести, разработать

rennet [´renit] – сычуг (твердый отдел желудка жвачного животн.)

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Степень бакалавра; 2) химик-лаборант; 3) преподаватель; 4) докторская степень; 5) изучение, исследования; 6) крупный рогатый скот; 7) полученный результат; 8) кормление (питание) животных; 9) химик; 10) кукуруза; 11) пшеница; 12) овес.

Task 2. Match.

	a) важная роль
1) further spell	b) вспомогательные (дополнительные)
2) agricultural station	пищевые факторы
3) efficient test	c) дополнительные доказательства
4) metabolic water	d) единственный источник
5) balanced diet	e) обменная (метаболическая) вода
6) single source	f) опытная сельскохозяйственная
7) agricultural chemistry	станция
8) further evidence	g) полноценный рацион
9) accessory [ək´sesəri] food	h) последующий короткий промежу-
factors	ток времени
10) important part	i) сельскохозяйственная химия
	j) эффективный метод

Task 3. Insert prepositions.

1) to gain a degree _____ a university
2) to become an instructor _____ university

3) to gain one's doctorate _____ smb.
4) _____ his return
5) to work _____ the analysis _____ milk
6) to become professor _____ agricultural chemistry
7) to devise a test _____ measuring smth.
8) studies _____ fermentation and animal nutrition
9) diets derived _____ a single source
10) provide evidence _____the existence of smth.
11) to play an important part _____ the studies

Task 4. Complete the sentences. Use the verbs from the box in the right form.

become	*work*	*gain*	*derive*	*play*	*feed*	*provide*	*devise*

1. Babcock _____his B.A. degree from Tufts College.
2. In 1875 he _____ an instructor at Cornell University.
3. At the New York Agricultural Station Babcock _____ on the analysis of milk.
4. At the University of Wisconsin Babcock _____ an efficient test for measuring the butterfat content of milk.
5. Babcock's associates _____ cattle on balanced diets.
6. The results obtained _____ further evidence for the existence of accessory food factors.
7. Babcock's school _____ an important part in the vitamins studies.
8. Scientists _____ the animal diet from a single source.

Task 5. Answer the questions.

1. When was Babcock born?
2. What was his farther?
3. When and where did Stephen M. Babcock gain his B.A. degree?
4. What did he do after graduating from Tufts College?
5. When did he start working as a chemistry assistant?
6. When did he become an instructor at Cornell University?
7. When and where did St.M. Babcock gain his doctorate?
8. Who was his scientific adviser?
9. What did Babcock do on his return to the USA?
10. What did he work on at the New York Agricultural Station?
11. When did he become professor at the University of Wisconsin?
12. What did he teach at the University of Wisconsin?
13. What test did he devise in 1890?

14. What studies followed the Babcock test?
15. What studies were carried out by Babcock's associates?
16. What evidence did the results obtained provide?
17. What research did Babcock's school play an important part in?

Task 6. Choose the correct alternative. Then translate the passage.

Babcock is best known for his test for butterfat in milk, 1) ***increased/introduced*** in 1890. By using *sulfuric acid* to release the fat from its normal 2) ***suspension/suspicion*** and centrifuging and *diluting*, it was 3) ***possible/positive*** to measure directly the percentage of fat by observing it in the *neck* of a specially 4) ***designed/derived*** test bottle. The simplicity of the test permitted its use by persons without scientific 5) ***training/draining***. Its use altered the economics of dairying and stimulated growth of the 6) ***diary/dairy*** industry.

With the bacteriologist Harry L. Russell, Babcock developed the process for *cold curing* of cheese in 1900. The great improvement in the quality of cheese led to wide 7) ***acceptance/expectancy*** of the process in the dairy industry.

Babcock's most important contribution arose from his skepticism regarding the biological equivalency of chemically similar feeds from 8) ***difficult/different*** crops. In 1907 four of his younger associates began a cattle-feeding 9) ***experience/experiment*** using chemically equivalent rations, each derived from a 10) ***different/indifferent*** plant. The experiment not only confirmed Babcock's skepticism but led to studies that helped develop the vitamin concept.

_____

sulfuric [sʌl´fjʊərik] *acid* – серная кислота
dilute [dai´l(j)u:t] – разбавлять, разводить, разжижать
neck – горлышко
cold curing – холодное отверждение / дозаривание / созревание

Task 7. Put the verbs in brackets in the Past Simple Active or Passive.

1. Babcock _____(*to die*) in 1931, in Madison, Wisconsin, from a heart attack. 2. His estate _____ (*to leave*) to the University of Wisconsin – Madison College of Agriculture. 3. In 1948, the Institute of Food Technologists _____ (*to create*) the Stephen M. Babcock Award in honor of Babcock's achievements. 4. The Institute of International Dairy Research and Development at Wisconsin _____ (*to name*) in Babcock's honor.

UNIT 2

Sir Rowland Harry Biffen
(1874–1949)
British Geneticist and Plant Breeder

1. Biffen was born in Cheltenham[1] and, after graduating in natural sciences from Cambridge[2] in 1896, joined a team investigating rubber production in Mexico[3], the West Indies[4], and Brazil[5]. On his return he was appointed lecturer in botany at Cambridge and patented a method for *handling rubber latex.*

2. Biffen *was inclined* more toward *applied* than *pure botany* and joined the Cambridge School of Agriculture shortly after its foundation in 1899. He began conducting cereal trials in order to select improved types, and when Gregor Mendel's[6] laws of inheritance were rediscovered in 1900, he realized immediately that they could be applied to improving plant-breeding methods. Biffen speculated that physiological as well as morphological *traits* would prove to be inherited in Mendelian ratios[7], and in 1905 demonstrated that this was true for resistance to yellow rust, a fungal disease of wheat.

3. Little Joss and Yeoman, two wheat varieties bred by Biffen, were unequaled for many years. In 1912 Biffen became director of the Plant Breeding Institute at Trumpington[8], a newly formed research center established by the government to promote Biffen's, work and the application of scientific principles to plant breeding. Biffen was also professor of agricultural botany at the university from 1908 to 1931 and *was instrumental in* setting up the National Institute of Agricultural Botany at Cambridge. He *was knighted* for his services to agriculture in 1925.

NOTES

[1] **Cheltenham** [ˊʧeltnəm] – г. Челтнем (Челтенхем), графство Глостешир, Англия

[2] **Cambridge** – Кембриджский университет

[3] **Mexico** [ˊmeksikəʊ] – Мексика

[4] **West Indies** – Вест-Индия, Карибский регион (совокупность островов Атлантического океана между Северной и Южной Америкой)

[5] **Brazil** [bræ´zil] – Бразилия

[6] **Gregor Mendel** – Грегор Мендель (1822–1884), чешско-австрийский биолог-генетик, монах-августинец, аббат. Основоположник учения о наследственности

[7] **Mendelian** [men´di:lian] **ratio** – менделевское соотношение (соотношение между гомо- и гетерозиготными формами при расщеплении)

[8] **Trumpington** – Трампингтон, деревня на окраине Кембриджа, в двух милях к югу от него

Some Useful Vocabulary

applied [ə´plaid] *botany* – прикладная ботаника

be inclined [in´klaind] – быть склонным (к чему)

be instrumental in – сыграть важную роль в чем, способствовать, содействовать

handle – обрабатывать, перерабатывать, производить

knight [nait] – (*n*) рыцарь, (*v*) присвоить звание рыцаря, присвоить личное (ненаследственное) дворянское звание

rubber latex [´leitəks] – каучуковый латекс

trait [trei] – характеристика, черта, качество, свойство, особенность

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Естественные науки; 2) производство каучука; 3) испытания зерновых; 4) законы наследования; 5) методы селекции растений; 6) желтая ржавчина; 7) грибковое заболевание; 8) сорта пшеницы; 9) не имели себе равных; 10) исследовательский центр.

Task 2. Match.

1) shortly after	a) а также
2) in order to	b) вскоре после этого
3) as well as	c) в течение многих лет
4) immediately	d) научные принципы
5) on his return	e) недавно созданный
6) newly formed	f) немедленно, тотчас
7) scientific principles	g) по возвращении
8) plant breeding	h) растениеводство, селекция растений
9) for many years	i) чтобы

Task 3. Complete the sentences using the expressions from Task 2.

1. You have to work hard _____ to succeed. Plants need light _____ to survive.
2. She chaired the department _____ .
3. He left _____ you did. We arrived _____ six o'clock.
4. The doctor had to perform surgery _____.
5. _____ has been practiced for thousands of years, since the beginning of human civilization.
6. _____ from Canada, he joined the army.
7. He demonstrated _____ using everyday objects.
8. She knows my bad points _____ my good points.
9. The US government has now recognized the _____ country.

Task 4. Match adjectives and nouns, translate the collocations.

1) natural	a) botany
2) applied	d) botany
3) improved	c) disease
4) physiological	d) institute
5) fungal	e) principles
6) scientific	f) sciences
7) national	g) traits
8) agricultural	h) types

Task 5. Insert prepositions.

1) to graduate _____ Cambridge; 2) to graduate _____ natural sciences; 3) a lecturer _____ botany _____ Cambridge; 4) a method _____ handling rubber latex; 5) to be inclined _____ applied botany; 6) to apply law of inheritance _____ improving plant-breeding methods; 7) resistance _____ yellow rust; 8) to be instrumental _____ setting up the institute; 9) to be knighted _____ one's services _____ agriculture.

Task 6. Work in pairs. Ask and answer the questions.

1. What Sir Rowland Harry Biffen (to be)?
2. Where Biffen (to be) born?
3. What university he (to graduate from) in 1896?
4. What he (to major in)?
5. What he (to do) after graduating?
6. What countries he (to work) in?
7. What R.H. Biffen (to be appointed) on his return?

8. What he (to patent)?
9. Why he (to join) the Cambridge School of Agriculture?
10. When the Cambridge School of Agriculture (to be founded)?
11. Why he (to conduct) cereal trials?
12. What (to be rediscovered) in 1900?
13. How R.H. Biffen (to use) Gregor Mendel's laws of inheritance?
14. What he (to demonstrate) in 1905?
15. What wheat varieties (to be bred) by Biffen?
16. When the Plant Breeding Institute at Trumpington (to be formed)?
17. Why the Institute (to be established)?
18. Who (to be appointed) director of the Plant Breeding Institute?
19. What he (to be responsible for) at the University?
20. What he (to be knighted) for?

Task 7. Fill in the gaps with the words from the box.

to promote	*investigating*	*fungal disease*	*select*	*appointed*	*services*
applied	*natural sciences*	*wheat varieties*	*rediscovered*	*instrumental*	

1. Biffen graduated from Cambridge in _____ . 2. He was involved in _____ rubber production. 3. On his return from South America he was _____ lecturer in botany at Cambridge. 4. Biffen was inclined to _____ botany. 5. He began conducting cereal trials in order to _____ improved types. 6. Gregor Mendel's laws were _____ in 1900. 7. Yellow rust is a _____ of wheat. 8. Two _____ bred by Biffen were unequalled for many years. 9. The British government wanted _____ Biffen's work and application of scientific principles of plant breeding. 10. Biffen was _____ in setting up the National Institute of Agricultural Botany at Cambridge. 11. He was knighted for his _____ to agriculture.

Task 8. Fill in the table with the missing information.

1874	Biffen was born
1896	?
1899	Cambridge School of Agriculture was founded
?	Mendel's laws of inheritance were rediscovered
1905	?
?	Became director of the Plant Breeding Institute at Trumpington
?	Professor of agricultural botany at the university
1925	?
1949	died

UNIT 3

Norman Ernest Borlaug [ˊbɔ:rlɔ:g]
(1914–2009)
American Agronomist and Plant Breeder

1. Borlaug was born in Cresco[1], Iowa[2], and graduated in forestry from Minnesota University[3] in 1937, gaining his doctorate in plant pathology in 1941. He then spent three years with the Du Pont Chemical Company[4], testing the effects of chemicals on plants and plant diseases. In 1944 he joined the newly formed International Maize and Wheat Improvement Center[5] in Mexico[6] and began the breeding work that was to produce the highly adaptable dwarf [dwɔ:f] wheats that played so large a part in the 'Green Revolution'[7] of the late 1960s and early 1970s.

2. Borlaug's high-yielding cereals increased agricultural production in the developing countries to the extent that many became self-sufficient for grain. For his major role in temporarily alleviating world famine, Borlaug was awarded the Nobel Peace Prize in 1970.

NOTES

[1] **Cresco** – г. Кресko, центр округа Говард, штат Айова

[2] **Iowa** [ˊaiəwə] – штат Айова

[3] **Minnesota** [miniˊsəutə] **University** – Миннесотский университет, или Университет Миннесоты, исследовательский университет, расположенный в Миннеаполисе и Сент-Поле, самых крупных городах штата Миннесота

[4] **Du Pont Chemical Company** – американская химическая компания Дюпон, одна из крупнейших в мире, основана в 1802 г. как предприятие по производству пороха

[5] **International Maize and Wheat Improvement Center** – Международный центр улучшения кукурузы и пшеницы, расположен в Мексике, основан в 1943 г.

[6] **Mexico** [ˊmeksikəu] – Мексика

[7] **Green Revolution** – ‘Зеленая революция’, комплекс изменений в сельском хозяйстве развивающихся стран в 1960^{x}–1970^{x} годах, кото-

рый привел к значительному увеличению мировой сельскохозяйственной продукции. Включал в себя активное выведение более продуктивных сортов растений и их внедрение в производство, расширение орошения, применение удобрений, пестицидов, современной техники

Some Useful Vocabulary

alleviate [ə´li:vieit] – ослаблять, уменьшать
became self-sufficient for– стали полностью обеспечивать себя (чем)
famine [´fæmin] – острая нехватка продовольствия, голод (стихийное бедствие)
temporarily [ˌtempə´rerəli] – на какое-то время
to the extent that – до такой степени, что

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Агроном; 2) растениевод/селекционер; 3) лесоводство; 4) докторская степень/получить докторскую степень; 5) фитопатология/патология растений; 6) болезни растений; 7) селекционная работа; 8) легко поддающаяся адаптации (адаптирующаяся) карликовая/низкорослая пшеница; 9) высокоурожайные зерновые культуры; 10) зерно; 11) мировой голод/нехватка продовольствия; 12) удостоиться (премии).

Task 2. Complete the sentences. Find the right words in the text.

1. Borlaug graduated from _____ .
2. He studied _____ at university.
3. He gained his doctorate in _____ in _____ .
4. While working for the Du Pont Chemical Company, Borlaug tested the effect of chemicals on _____ .
5. In 1944 he began the _____ .
6. Borlaug's dwarf wheat played a large part in the _____ _____.
7. High-yielding cereals increased _____ .
8. Many developing countries became _____ for grain.
9. Borlaug contributed to temporarily alleviating _____ _____.
10. Borlaug was awarded the _____ _____ for his work.

Task 3. Work in pairs. Ask and answer the questions.

1. What N.I. Borlaug (to be)?
2. Where he (to be born)?

3. What university he (to graduate from)?
4. What he (to major in) at university?
5. When he (to gain) his doctorate?
6. What doctorate he (to gain)?
7. Where he (to spend) three years after that?
8. What research he (to do) at the Du Pont Chemical Company?
9. Why he (to go) to Mexico in 1944?
10. What the goal of his work there (to be)?
11. When the Green Revolution (to take place)?
12. What (to help) the developing countries to become self-sufficient for grain?
13. What N. I. Borlaug (to be awarded) in 1970?
14. What he (to receive) the award for?

Task 4. Fill in the gaps with words and phrases from the box.

short-stemmed *disease-resistant* *high-yielding* *food shortages* *starvation* *research scientist* *food grains* *earned* *research station* *dwarf wheat*

Borlaug studied plant biology and forestry at the University of Minnesota and 1) _____ a Ph.D. in plant pathology there in 1942. He began working with the DuPont Company in 1942 but was soon recruited as a 2) _____ in charge of wheat **improvement** for the Rockefeller Foundation's Cooperative Mexican Agricultural Program in Mexico, where he worked from 1944 to 1960. Seeking to assist **impoverished** farmers who struggled with diseased and low-producing crops, Borlaug experimented with novel varieties of wheat, creating 3) _____ strains that could withstand the harsh climate. That work was founded on earlier discoveries of ways to induce genetic mutations in plants, and his methods led to modern plant breeding.

The Green Revolution resulted in increased production of 4) _____ (especially wheat and rice) and was in large part due to the introduction into developing countries of new, 5) _____ varieties, beginning in the mid-20th century with Borlaug's work. At a 6) _____ at Campo Atizapan, he developed a short-stemmed ("dwarf") strain of wheat that dramatically increased **crop yields**. Previously, taller wheat varieties would break under the weight of the heads if production was increased by **chemical fertilizers**. Borlaug's 7) _____ wheat could withstand the increased weight of fertilized heads and was a key element in the Green Revolution in developing

countries. Wheat production in Mexico multiplied **threefold** owing to this and other varieties.

Following Borlaug's success in Mexico, the Indian and Pakistani governments requested his **assistance**, and with the support of the Rockefeller Foundation and the Food and Agriculture Organization of the United Nations (FAO), Borlaug began his agricultural revolution in Asia. With India and Pakistan facing 8) _____ due to rapid **population growth**, the importation of Borlaug's 9) _____ in the mid-1960s was responsible for a 60 percent increase in harvests there, helping both countries to become agriculturally self-sufficient. His work in developing countries, especially on the Indian subcontinent, is estimated to have saved as many as one billion people from 10) _____ and death.

Task 5. Decide if the statements are TRUE or FALSE. Correct false statements.

1. In Mexico Borlaug was responsible for creating new varieties of grain crops.
2. Borlaug experimented with novel varieties of corn.
3. Diseased and low-producing crops resulted in increased production of wheat and rice.
4. Taller wheat varieties dramatically increased crop yields.
5. Borlaug was asked by Indian and Pakistani governments to help their countries, too.
6. Thanks to the Green Revolution many people on the Indian subcontinent were saved from famine.

Task 6. Complete the sentences with the words and phrases in bold from the text in Task 4.

1. Intensive agriculture is based on the use of _____ _____.
2. Advances in technology have improved _____ _____ by over 30 %.
3. Food production is not keeping up with _____ _____.
4. Doctors were amazed by the sudden _____ in her medical condition.
5. Unemployment increased _____ and poverty rose among more than two thirds of the population.
6. The company needs more financial _____ from the government.
7. Girls also increasingly migrate from _____ rural areas in search of domestic work.

UNIT 4

Luther Burbank [ˊbɜ:baŋk]
(1849–1926)
American Plant Breeder

1. Burbank was brought up on a farm in Lancaster[1], Massachusetts[2], and received only an elementary education. He began breeding plants in 1870, when he bought a seven-hectare plot of land. After about a year he had developed the Burbank potato, which was introduced to Ireland to help combat the blight epidemics. By selling the rights to this potato he made $150, which he used to travel to California[3], where three of his brothers had already settled.

2. Burbank established a nursery and experimental farm in Santa Rosa[4], where the climate was especially conducive to fruit and flower breeding, which became his occupation for the next 50 years. He worked by making multiple crosses between native and introduced strains, using his remarkable skill to select commercially promising types. These were then grafted onto mature plants to hasten development, so that their value could be rapidly assessed. In this way he produced numerous new cultivated varieties of plums, lilies, and many other ornamentals and fruits.

3. The works of Charles Darwin[5], particularly *The Variation of Animals and Plants under Domestication*[6], greatly influenced Burbank. However his success in varying plant characters reinforced his belief in the inheritance of acquired characteristics, even though he knew of Gregor Mendel's[7] research.

NOTES

[1] **Lancaster** [ˊlæŋkəstə] – г. Ланкастер

[2] **Massachusetts** [ˊmæsəˊʧu:sits] – Массачусетс, штат США

[3] **California** [ˌkaliˊfɔ:niə] – Калифорния, штат США

[4] **Santa Rosa** – Санта-Роза, город в штате Калифорния

[5] **Charles Darwin** – Чарльз Дарвин (1809–1882) английский натуралист

[6] **The Variation of Animals and Plants under Domestication** – «Изменение животных и растений в домашнем состоянии», книга Чарльза

Дарвина, опубликованная в 1868 году и посвящённая приведению доказательств в пользу нового учения о происхождении видов

[7] **Gregor Mendel** – Грегор Мендель (1822–1884), чешско-австрийский биолог-генетик, монах-августинец, аббат. Основоположник учения о наследственности

Some Useful Vocabulary

be conducive [kən´djusiv] *to* – способствовать (чему), быть благоприятным (для)

blight [blait] – болезнь растений, характеризующаяся завяданием, прекращением роста, опаданием листьев без гниения

blight epidemics (*in Ireland* [´aiələnd]) – Ирландский картофельный голод (1845–1849), произошел из-за эпидемии картофельного патогенного микроорганизма, вызывающего фитофтороз

bring up – воспитывать, растить (ребенка)

graft – (*с.-х.*) прививать (растение)

hasten [´heisn] – ускорить

strain – линия (растений), сорт

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Участок земли; 2) теплица/питомник; 3) занятие/ремесло; 4) экономически перспективный/обладающий коммерческим потенциалом; 5) скрещивание/множественные скрещивания; 6) культурные сорта; 7) местные сорта; 8) завезенные сорта; 9) декоративные растения; 10) приобретенные свойства.

Task 2. Complete the sentences with the right words from the text.

1. Burbank was _____ _____ on a farm.
2. He _____ only an elementary education.
3. He began _____ _____ in 1870.
4. He _____ _____ the Burbank potato.
5. The Burbank potato _____ _____ to Ireland to help _____ the blight epidemics.
6. By selling the rights to this potato he _____ $150.
7. Burbank _____ a nursery and experimental farm in Santa Rosa.
8. In Santa Rosa the climate was especially _____ _____ fruit and flower breeding.

9. He worked by making _____ _____ between native and introduced strains.

10. He _____ commercially promising plants and _____them onto mature plants to_____ development.

11. In this way he _____ numerous new cultivated varieties of ornamentals and fruits.

Task 3. Match adjectives with nouns, translate the combinations.

1) elementary	a) characteristics
2) experimental	b) crosses
3) multiple	c) education
4) native	d) farm
5) remarkable	e) plants
6) mature	f) skill
7) cultivated	g) strains
8) acquired	h) varieties

Task 4. Complete the sentences with the words and word combinations from the box.

graft	*to make money*	*conducive*
introduced the potato	*breed plants*	*sell the rights*
nursery	*receive education*	*plot of land*
hasten	*high-yielding*	*to combat*

1. Only about 6,000 children with disabilities _____ _____ in special schools.

2. EU funding is helping to _____ _____ with desirable traits such as improved fungi resistance, drought resistance and high yield.

3. They want to buy a _____ ___ _____ close to the village to start growing vegetables.

4. Potato growing spread in the Province of Bolonga in the early 19th century, promoted in particular by the agronomist Pietro Maria Bignami, who _____ ___ _____ to farmers.

5. Farmers of organic potatoes have traditionally used copper-based fungicides _____ the late blight potato pathogen.

6. She decided to cash out and _____ ___ _____ to her invention.

7. I can't afford to play when I have ___ _____ _____ for my family.

8. In Ghana, the Timber and Wood Workers Union established a _____ and tree plantation as a showplace and training ground for good forest practices.

9. The climate was mild and _____ to life or growth.

10. It would seem unusual, even unnatural, to _____ a wild branch onto a cultivated tree; yet, that is what some farmers did in the first century.

11. Oat-breeders in the United States began to produce a new _____ variety of oats.

12. The practice of pinching or puncturing the figs was to _____the ripening and increase the size and sweetness of the fruit.

Task 5. Work in pairs. Ask and answer the questions.

1. Where Burbank (to be born)?
2. What education he (to receive)?
3. When he (to begin) breeding plants?
4. What he (to buy) to start plant breeding?
5. What crop he (to develop) soon?
6. Where and why the Burbank potato (to be introduced)?
7. Why he (to sell) the rights to this potato?
8. What he (to do) in Santa Rosa?
9. Why he (to decide) to settle in Santa Rosa?
10. How he (to work)?
11. What types of fruit and flowers he (to select)?
12. What he (to do) with these types?
13. Why he (to want) to hasten development?
14. What cultivated varieties he (to produce)?
15. What scientist (to influence) Burbank?
16. What his success in varying plant characters (to reinforce)?
17. He (to be familiar with) Gregor Mendel's research?

Task 6. Read the text and find answers to these questions.

1. What is the 'Burbank potato' famous for?
2. How can Burbank's success in a nursery business be explained?
3. Name some of the most successful strains and varieties Burbank bred.
4. Burbank is known to have introduced more than 60 varieties of spineless cacti ['kæktai]. Why did he develop them?
5. Why was Burbank criticized by scientists of his day?
6. What books did he author?
7. What happened to Burbank's home and gardens after his death?

Luther Burbank was an American horticulturist. He developed more than 800 strains and varieties of plants over his 55-year career.

horticulturist ['hɔ:tɪ'kʌlʧ(ə)rɪst] – садовник, овощевод, цветовод

From his childhood Burbank loved plants and often gathered the seeds of wildflowers to grow at home. After finishing school and trying factory work, which proved detrimental to his health, he bought a small plot of land and started to grow vegetables for market.

detrimental ['detrɪ'mentl] – вредный, пагубный (для здоровья)

In 1872, Burbank found a seed ball on one of the potato plants in his garden (potato plants only rarely produce seeds). One of the seeds produced a new variety of potato that was later named the "Burbank potato." Burbank sold the new potato to a seed dealer for $150. A natural sport (genetic variant) of the Burbank potato with russet (reddish-brown) skin later became known as the Russet-Burbank potato: this large, brown-skinned, white-fleshed potato has become the predominant processing potato in the United States. French fries served in McDonald's restaurants are made exclusively from this cultivar.

seed ball – семенная коробочка
sport – (*биол.*) мутация, почковая мутация
russet ['rʌsɪt] – красновато-коричневый
cultivar ['kʌltɪvɑ:] – выведенный сорт, сорт (культурного растения)

In 1875, Burbank decided to move to California, partly because three of his brothers lived there and partly because he felt the climate and conditions there were better for horticultural work. He settled in Santa Rosa and soon purchased a four-acre plot of land on which he started a nursery business.

Burbank's real interest was not just in growing plants but in trying to improve them and make them more useful to humankind.

Burbank's method was to cross-pollinate plants of different varieties and even different species, to grow large numbers of the new hybrids, and to select the best plants of the new generation to start a new variety. He had hundreds of experimental plantings, and many thousands of plants, at any one time. Part of the reason for his success is these large numbers, and part is his own special genius in knowing what crosses to try and which of the offspring to select for further work.

cross-pollinate – перекрестно опылять
species ['spi:ʃi:z] – биологический вид
hybrid ['haɪbrɪd] – гибрид
at any one time – единовременно, одновременно
cross – скрещивание, кросс
offspring – потомство

Burbank's most successful strains and varieties include the Shasta daisy, the Fire poppy, the July Elberta peach, the Santa Rosa plum, the Flaming Gold nectarine, the Burbank plum, the Freestone peach, and the Burbank potato. Burbank also bred the white blackberry and the nectarine. One his

most famous creations is the spineless cactus, which provides food for both cattle and people. He had high hopes that this would revolutionize agriculture in desert regions and help to end world hunger. It was not quite the success he had hoped, but it is still being grown in many places.

Shasta daisy – нивяник великолепный
freestone peach – персик с отделяющейся косточкой
spineless cactus – кактус без колючек

Burbank was criticized by scientists of his day because he did not keep the kind of careful records that are the norm in scientific research and because he was mainly interested in getting results rather than in basic research. Jules Janick, Ph.D., Professor of Horticulture and Landscape Architecture, Purdue University, writing in the *World Book Encyclopedia*, 2004 edition, says: "Burbank cannot be considered a scientist in the academic sense."

Burbank wrote, or co-wrote, several books on his methods and results, including his eight-volume *How Plants Are Trained to Work for Man* (1921), *Harvest of the Years* (with Wilbur Hall, 1927), *Partner of Nature* (1939), and the 12-volume *Luther Burbank: His Methods and Discoveries and Their Practical Application*. Burbank also published in 1893 a descriptive catalog of some of his best varieties, entitled *'New Creations in Fruits and Flowers'*.

In 1986, Burbank was inducted into the National Inventors Hall of Fame. The Luther Burbank Home and Gardens, in downtown Santa Rosa, are now designated as a National Historic Landmark.

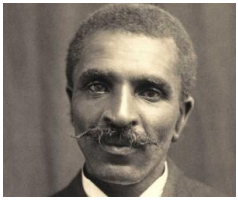
National Inventors Hall of Fame – Национальный зал славы изобретателей
designate ['dezɪgneɪt] – признать, присвоить статус
National Historic Landmark – национальный памятник архитектуры

Task 7. Match the sentence halves.

1. Burbank wrote several	a) and even different species.
2. Keeping careful records is	b) are made from the 'Burbank potatoes'.
3. The spineless cactus can provide	c) books on his methods and results.
4. Burbank bred a lot of successful	d) food for both cattle and people.
5. Growing spineless cacti could	e) revolutionize agriculture in desert regions.
6. He cross-pollinated plants of different varieties	f) strains and varieties of plants.
7. French fries served in McDonald's restaurants	g) the norm in scientific research.

UNIT 5

George Washington Carver
(1864–1943)
American Agricultural Chemist



1. Carver was born a slave in Diamond Grove[1], Missouri[2]. Nevertheless, he managed to acquire some elementary education and went on to study at the Iowa[3] State Agricultural College from which he graduated in 1892. He taught at Iowa until 1896, when he returned to the South to become director of the department of agricultural research at the Tuskegee Institute[4], Alabama[5]. There he stayed despite lucrative offers to work for such magnates as Henry Ford[6] and Thomas Edison[7].

2. His main achievement was to introduce new crops into the agricultural system of the South, in particular arguing for large-scale plantings of peanuts and sweet potatoes. He saw that such new crops were vital if only to replenish the soil, which had become impoverished by the regular growth of cotton and tobacco.

3. But he did much more than to introduce new crops for he tried to show that they could be used to develop many new products. He showed that peanuts contained several different kinds of oil. So successful was he in this that by the 1930s the South was producing 60 million dollars' worth of oil a year. Peanut butter was another of his innovations. In all, he is reported to have developed over 300 new products from peanuts and over 100 from sweet potatoes.

NOTES

[1] **Diamond Grove** – сейчас Даймонд, город в штате Миссури

[2] **Missouri** [mɪ'zu(ə)rɪ] – Миссури, штат США

[3] **Iowa** ['aɪəwə] – Айова, штат США

[4] **Tuskegee Institute** – Институт Таскиги (ныне – Университет Таскиги), частный университет для чернокожих, расположенный в г. Таскиги

[5] **Alabama** ['ælə'bæmə] – Алабама, штат США

[6] **Henry Ford** – Генри Форд (1863–1947), американский промышленник, владелец заводов по производству автомобилей, изобретатель

[7] **Thomas Edison** – Томас Алва Эдисон (1847–1931), американский изобретатель и предприниматель

Some Useful Vocabulary

argue for ['ɑ:gju:] – приводить доводы (в пользу чего), защищать, отстаивать (что)
acquire [ə'kwaɪə] – получать, приобретать
if only – пусть даже; хоть для того, чтобы
impoverish – обеднять, истощать (почву)
replenish – (*зд.*) восстановить, ремонтировать
slave [sleɪv] – раб, невольник
vital ['vaɪtl] – крайне необходимый, жизненно важный

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Тем не менее; 2) несмотря на; 3) выгодные предложения; 4) достижение; 5) в частности; 6) крупномасштабные посадки; 7) сладкий картофель / батат; 8) арахис; 9) постоянное выращивание хлопка и табака; 10) так как; 11) арахисовое масло; 12) нововведение; 13) в общем итоге, вообще.

Task 2. Decide if the statements are TRUE or FALSE. Correct false statements.

1. Carver was born into a rich family.
2. He got a very good school education.
3. He graduated from an agricultural college.
4. He worked as a teacher at Iowa State Agricultural College.
5. He was appointed to a responsible post at the Tuskegee Institute.
6. Later he accepted an offer from Tomas Edison.
7. As a researcher he introduced new crops into agricultural system of the South.
8. He insisted that the regular growth of cotton and tobacco had impoverished the soil.
9. Thanks to George W. Carver many new products were developed from peanuts.
10. More than 300 new products were developed from sweet potatoes.

Task 3. Complete the sentences with the right words from the text.

1. Carver managed to _____ some elementary education.

2. He went on to study at_____ _____ _____ _____.
3. He _____ from the college in 1892.
4. He _____ at Iowa until 1896.
5. Then he became director of _____ _____ _____ at the Tuskegee Institute.
6. He refused to work for such _____ as _____ _____ and _____ _____.
7. He introduced new crops into the _____ _____ of the South.
8. Carver argued for _____ _____ of peanuts and sweet potatoes.
9. These new crops were vital to _____ _____.
10. The soil had become _____ by the _____ _____ of cotton and tobacco.
11. He _____ many new products from peanuts.
12. He showed that peanuts _____ different kinds of _____.
13. _____ _____ was one of his innovations.

Task 4. Fill in the gaps with the right verbs.

become replenish graduate acquire contain develop

1. _____ from the college
2. _____ director of the department
3. _____ the soil
4. _____ some elementary education
5. _____ new products from peanuts
6. _____several different kinds of oil

Task 5. Match adjectives with nouns, translate the combinations.

1) elementary	a) achievement
2) agricultural	b) crops
3) lucrative	c) education
4) main	d) growth
5) new	e) offers
6) sweet	f) potatoes
7) impoverished	g) research
8) regular	h) soil

Task 6. Complete the sentences with the combinations from Task 5.

1. We need to invest in agriculture and _____ _____.
2. Yams, _____ _____ and similar edible parts of plants contain 5 % or more by weight of starch.

3. My manager was surprised that I turned down his _____ _____.

4. This was the _____ _____ of mathematical economics.

5. That farming technique had two results: _____ _____ and contaminated water.

6. The soil became impoverished by the _____ _____ of cotton and tobacco.

7. _____ _____ has been declared to be a fundamental right.

8. Developing country farmers generally find it difficult to diversify into _____ _____ because of lack of experience with the techniques.

Task 7. Derive the right forms from the given words.

George Washington Carver was a great African-American scientist and 1)_____. He developed different products from peanuts, sweet potatoes and soya beans that radically changed the 2)_____ economy of the United States.	INVENT AGRICULTURE
George Carver was born in Diamond, Missouri, around 1864. The exact year and date of his birth are 3)_____.	KNOW
George went to different schools before he got his diploma at Minneapolis High School at Kansas. At that period of time it was 4)_____ for Carver to join Highland College because he was black.	POSSIBLE
Carver was 5)_____ not only in science; he was also keen on the arts. He developed his painting skills through drawings of different plants. 6)_____ made it possible to combine his two loves – art and nature.	INTEREST PAINT

Task 8. Put the verbs in brackets in the Past Simple. Read and translate the text.

Contributions and Achievements:

George Carver _____ (*to begin*) teaching as Iowa State Agricultural College's first black faculty member. His successful work in plant pathology and mycology _____ (*to gain*) him countrywide acclaim and fame as a prominent botanist.

In 1896, Carver _____ (*to move*) to Alabama as head of the Agriculture Department at the Tuskegee Institute (now Tuskegee University), a historically black college, where he _____ (*to work*) until his death 47 years later.

Carver _____(*to be*) a farmer's scientist. He _____(*to teach*) farmers how to grow better plants, utilizing farm waste products. He _____ (*to turn*) corn stalks into building materials. Carver _____ (*to find*) dyes in the rich clay soil. He _____ (*to manufacture*) more than 100 products from sweet potatoes.

A lack of crop rotation _____(*to be*) a problem in America's southern states. Repeated plantings of cotton were depleting the soil of its nutrients. Carver _____ (*to promote*) nitrogen-providing peanuts as an alternative crop to cotton to prevent soil depletion. He _____(*to advocate*) farmers rotate their crops between cotton and the highly nutritious food crops of peanuts and sweet potatoes.

Task 9. Choose where the words best fit the gaps. Then translate the sentences.

1. ***waste products* / *corn stalks***

a. Isabelle was no gardener but she at least recognized _____.

b. This allows farms to feed the livestock with the _____ of other industries such as potato and pumpkin peelings from local restaurants.

2. ***peanut butter* / *food crops***

a. Don't scant the _____ on those sandwiches!

b. Commercial interest at the international level in research and development of the typical African _____ is therefore small.

3. ***crop rotation* / *soil depletion***

a. The practice of _____ entails growing different crops in sequence.

b. The increasing population density in rural Africa, with its intensification of farming, is leading to massive _____.

4. ***repeated planting* / *building material***

a. Her company developed a new kind of _____ that withstands all kinds of weather.

b. This hybrid vigor deteriorates through _____.

5. ***replenish* / *impoverish***

a. Fast-growing trees remove nutrients and _____ the soil.

b. The key to increasing yields is to ensure that even the poorest farmers have access to improved seed varieties, chemical fertilizers, organic matter to _____ nutrients, and, where possible, small-scale irrigation methods, such as a pump to lift water from a nearby well.

6. ***nutrients* / *achievements***

a. The plant absorbs _____from the soil.

b. I believe that those _____ speak for themselves.

UNIT 6

Dokuchaev, Vasily Vasilievich
(1846–1903)
Russian Soil Scientist

1. Dokuchaev was born in Milyukovo near Smolensk, Russia, the son of the village priest. He too was originally trained for the priesthood but later turned to the study of science at St. Petersburg University where he graduated in 1871. He was immediately appointed to the faculty, initially as curator of the geological collection but he also served as professor of geology until poor health forced him to retire in 1897.

2. Dokuchaev made the first comprehensive scientific study of the soils of Russia, details of which are to be found in his *Collected Works* (9 vols. 1949-61). He also, in the 1890s, set up at the Kharkov Institute of Agriculture and Forestry, the first department of soil science in Russia.

3. In the West he is mainly known for his work on the classification of soils, his insistence that sod is a geobiological formation, and his use of soil to define the different geographical zones.

4. It is also owing to Dokuchaev that the Russian term *chernozem*, used to describe a black soil rich in humus and carbonates, has entered most languages.

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Профессорско-преподавательский состав; 2) хранитель геологической коллекции; 3) уйти в отставку; 4) всестороннее научное исследование; 5) собрание сочинений; 6) почвоведение; 7) дерн / дерновый покров; 8) перегной / гумус; 9) деревенский священник; 10) занимать должность.

Task 2. Complete the sentences using the words from the text.

1. Dokuchaev graduated from_____.
2. After graduation he became _____.
3. He also served as _____.

4. He had to retire because of his _____ .
5. As a scientist Dokuchaev studied _____.
6. At the Kharkov Institute of Agriculture and Forestry he set up _____.
7. Dokuchaev is known for _____ .
8. Chernozem is a black soil rich in _____.

Task 3. Work in pairs. Ask and answer the questions.

1. What Dokuchaev (to be)?
2. Where he (to be born)?
3. What his father (to be)?
4. What he (to study) at university?
5. What university he (to study)?
6. When he (to graduate) from the university?
7. What he (to do) after graduation?
8. What subject he (to teach) as professor?
9. Why he (to retire)?
10. What scientific study he (to make)?
11. What department he (to set up) in the 1890s? Where?
12. What he (to be known) for in the West?
13. What he (to insist) on?
14. How he (to define) different geographical zones?
15. What term he (to coin = ввести в обращение, придумать)?
16. How this term (to be used)?

Task 4. Fill in the gaps with the missing parts of the sentences.

a) *carried out research on*
b) *curator of the geological collection*
c) *dissertation was devoted to*
d) *scientific activity was connected with*
e) *to give a special course*
f) *with a master's degree*

In 1871 Dokuchaev graduated from St. Petersburg University 1) _____. His 2) _____ the study and description of the alluvial deposits of the Kachna River, on the upper reaches of the Volga, near his birthplace. From that time Dokuchaev's 3) _____ St. Petersburg University, the Society of Natural Scientists, the Free Economic Society, the Mineralogical Society, and the Petersburg Assembly of Agriculturists. With the support of these groups he 4) _____ the Russian plains and in the Cauca-

sus. In the fall of 1872 he was made 5) _____ of St. Petersburg University, and in 1879 he became *Privatdozent* in geology. Along with his courses in mineralogy and crystallography he began 6) _____, the first anywhere, *on* Quaternary deposits.

alluvial [ə'lu:vɪəl] *deposits*– аллювиальные/наносные/речные отложения
upper reaches – верховье (реки), верхнее течение
agriculturist ['ægrɪ'kʌlʧ(ə)rɪst] – земледелец/хлебороб/аграрий
plains [pleɪn] – степи, равнины
Caucasus ['kɔ:kəsəs] – Кавказ
Quaternary [kwə'tɜ:nərɪ] *deposits* – четвертичные отложения

Task 5. Choose the correct alternative, and then translate the text.

In 1891 there was a 1) ***severe/several*** *drought* [draut] in Russia, and Dokuchaev subordinated his scientific work to the problem of dealing with this 2) ***accident/disaster***. He was commissioned by the Ministry of State Lands to undertake a special 3) ***expedition/exposition*** that was to devise ways and means of conducting farming, forestry, and water management in the steppe (chernozem) zone. The basis of the 4) ***walk/work*** of the expedition was a plan set forth by Dokuchaev in his book *Nashi stepi prezhde i teper* ("Our Steppes Past and Present," 1892), which 5) ***excluded/included*** preliminary geological, soil, and climatic findings. Three experimental plots in the steppe belt, each about 5,000 hectares, were chosen to survey: Starobelsky, in the watershed between the Don and the Donets; Khrenovsky, between the Volga and the Don; and Veliko-Anadolsky, in the watershed between the Donets and the Dnieper. Of great 6) ***improvement/importance*** was the network of meteorological stations and rain-gauge points set up on these plots. The careful 7) ***observations/obstacles*** of the climate of the steppe zone made it possible to determine the influence of climatic conditions on agriculture, 8) ***particularly/immediately*** the role of forests and protective forest belts. Much work was done on artificial forest cultivation, the regulation and use of water resources, and the building of reservoirs.

Task 6. Match the English phrases with their Russian equivalents.

1) scientific work	a) ведение сельского хозяйства
2) devise ways and methods	b) влияние на сельское хозяйство
3) conducting farming	c) водные запасы
4) water management	d) дождемерные пункты
5) set forth a plan	e) защитная лесополоса
6) preliminary findings	f) иметь большое значение
7) experimental plots	g) искусственное лесоразведение

8) be of great importance	h) климатические условия
9) rain-gauge [geidʒ] points	i) научная работа
10) climatic conditions	j) подробно изложить план
11) influence on agriculture	k) предварительные результаты
12) protective forest belt	l) разработать пути и способы
13) artificial forest cultivation	m) рациональное водоиспользование
14) water resources	n) экспериментальные участки

Task 7. Complete the sentences with the words and word combinations from the box.

emphasized	*organizers*	*defended as*
influenced	*soil map*	*accomplishments*
earlier hypotheses	*new classification*	*zonality of soil*
for each zone	*wide recognition*	*profound study*

1. Dokuchaev's first major work, "Sposoby obrazovania rechnykh dolin Evropeyskoy Rossii" ("Methods of Formation of the River Valleys of European Russia"), *was* _____ a doctor's thesis in 1878.

2. This work was the result of years of _____ of the geological, orographical, and hydrographical peculiarities of the Russian plain.

3. He analyzed various _____ on the formation of the river plains

4. Dokuchaev was one of the _____ and leaders of the Eighth Congress of Russian Natural Scientists and Physicians.

5. He _____ the necessity of creating a soil institute and museum.

6. Dokuchaev also carried out the compilation of a new _____ of European Russia.

7. Dokuchaev continually sought to popularize the _____ *of science*.

8. Dokuchaev created a _____ of soils according to natural history.

9. Dokuchaev established the _____ and its coincidence with the zonality of climate, vegetation, and animal life.

10. Dokuchaev stressed that agriculture should be carried out on a zonal basis and defined the main problems of agricultural technology _____.

11. Dokuchaev's work greatly _____ the development of physical geography and geobotany, and made a great contribution to the study of swamps.

12. His ideas received _____.

UNIT 7

Kramer, Paul Jackson
(1904–1995)
American Plant Physiologist

1. Kramer was born in Brookville[1], Indiana[2], and graduated in botany from the University of Miami[3], obtaining his PhD from Ohio State University[4] in 1931. He immediately joined the faculty of Duke University[5], North Carolina[6], and spent his entire career there serving as professor of botany from 1945 until his retirement in 1974.

2. Kramer worked on problems of the absorption of water by plants, surveying the subject in his *Plant and Soil Water Relationships* (1949). He demonstrated that two different mechanisms are involved in water uptake by roots, depending on whether the plants are transpiring quickly or slowly. He also showed the importance of taking plant water stress into account when making correlations between soil moisture and plant growth. In studies using radioactively labeled elements he found that the region of maximum absorption in roots is not the tip but the area several centimeters behind the tip where the xylem conducting vessels are fully formed. Other researches led Kramer to the conclusion that substantial amounts of minerals enter plant roots passively in the transpiration stream.

3. Kramer also worked on the physiology of trees, publishing with Theodore Kozlowski *The Physiology of Woody Plants* (1979), an update of an earlier 1960 joint work.

NOTES

[1] **Brookville** – г. Бруквилл

[2] **Indiana** ['ɪndɪ'ænə] – Индиана, штат США

[3] **University of Miami** [maɪ'æmɪ] – Университет Майами, частный светский университет в США, созданный в 1925 году, основной кампус которого расположен в городке Корал Гейблз штата Флорида.

[4] **Ohio** [əu'haɪəu] **State University** – Университет штата Огайо, государственный исследовательский университет, расположенный в городе Колумбус, штат Огайо.

[5] **Duke University** – Университет Дьюка (Дюкский университет), частный исследовательский университет, расположенный в г. Дареме, штат Северная Каролина

[6] **North Carolina** ['nɔ:θ'kærə'lainə] – Северная Каролина, штат США

Some Useful Vocabulary

radioactively labeled elements – радиоактивно меченые элементы
survey the subject – дать общий обзор проблемы
tip – кончик
transpiration stream –транспирационный ток
transpire – испариться
update – уточненный вариант, переработка и обновление
water uptake – забор воды, поглощение влаги (растениями)
xylem ['zailəm,-lem] – ксилема, древесные волокна

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Профессорско-преподавательский состав; 2) выход на пенсию; 3) почвенная вода; 4) поглощение воды растениями; 5) почвенная влага; 6) рост растений; 7) корни; 8) древесные растения; 9) сосуды; 10) недостаток воды (в растении); стресс, вызванный недостатком воды; 11) совместная работа.

Task 2. Insert prepositions.

1) graduated ___ botany ___ the University
2) obtained his PhD ___ Ohio State University
3) joined the faculty ___ Duke University
4) served ___ professor ___botany ___1945 ___ his retirement ___ 1974
5) worked ___ the problems ___ absorption ___ water ___ plants
6) different mechanisms are involved ___ water uptake ___roots
7) take plant water stress ___ account
8) region ___ maximum absorption ___ roots
9) the area several centimeters ___ the tip
10) lead smb ___ the conclusion that…

Task 3. Translate into English.

1) изучал ботанику в Университете Майами
2) получил докторскую степень в Университете штата Огайо
3) сразу же стал преподавателем Дюкского университета
4) работал на протяжении всей своей карьеры в должности профессора ботаники
5) работал над проблемой поглощения воды растениями
6) дал общий обзор проблемы в своей книге «…»

7) различные механизмы участвуют (используются) в поглощении воды корнями

8) в зависимости от

9) испарение влаги с листьев растений происходит быстро или медленно

10) важность учета недостатка воды в растениях при установлении корреляции между влажностью почвы и ростом растений

11) область максимального поглощения (воды) в корнях

12) использовать радиоактивно меченые атомы

13) ксилемные проводящие сосуды

Task 4. Match adjectives with nouns and then complete the sentences with these word combinations.

A

1) entire	a) absorption
2) different	b) amount
3) maximum	c) career
4) several	d) centimeters
5) substantial	e) mechanisms
6) woody	f) plants
7) joint	g) work

B

1. Once the fingerlings are _____ _____ long, they can be stocked into grow out ponds.

2. A _____ _____ of local labour was utilized on the project.

3. I spent my _____ _____ doing something I believed in.

4. Botany is the study of all types of general plants, while dendrology studies only _____ _____.

5. _____ _____ are needed to encourage and reward innovation in the public sector.

6. We regard the results of our _____ _____ as positive.

7. Its water solution has _____ _____ at about 520nm.

Task 5. Translate the following word chains into Russian.

1) Water uptake; 2) plant water stress; 3) soil moister; 4) plant growth; 5) xylem conducting vessels; 6) plant roots; 7) transpiration stream.

Task 6. Work in pairs. Ask and answer the questions.

1. Where Kramer (to be born)?

2. What he (to study) at the University of Miami?
3. What university he (to obtain) his PhD?
4. What he (to do) right after obtaining his doctorate?
5. How long he (to serve) as professor of botany at Duke University?
6. What problems Kramer (to work) on?
7. What book he (to survey) the subject in?
8. What he (to demonstrate) in his book?
9. What else he (to show) there?
10. How he (to find) the region of maximum water absorption?
11. What (to be) the result of his studies?
12. What conclusion Kramer (to make) about the way minerals enter plant roots?
13. Who Kramer (to work) with on the physiology of trees?
14. What (to be) the result of their joint work?

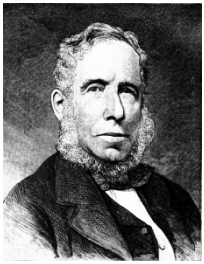
Task 7. Complete the sentences with the verbs from the box.

transpire obtained serve as retire work on take into account demonstrated be involved lead to the conclusion

1. The tree's roots _____ a barrier against soil erosion.
2. You must _____ the fact that he is too young.
3. Trees _____ water at a rapid rate.
4. He had to _____ because of ill health.
5. He's about to set to _____ a second book. First, _____ the problems you can do something about.
6. This could _____ that the land titles were obtained by fraud.
7. It has been _____ in various researches that the private sector has little influence over policy making.
8. He is a professional actor, who seeks to improve and to _____ into the film-making industry.
9. She then moved to the US and _____ her Ph.D in microbiology from the University of Pennsylvania.

UNIT 8

Lawes, Sir John Bennet
(1814–1900)
British Agricultural Chemist



1. Lawes was the only son of the lord of the manor of Harpenden[1] in Hertfordshire[2] and inherited his father's estates in 1822. He was educated at Eton[3] and Oxford University[4], but he left without taking a degree. He developed an interest in science, particularly chemistry, and at the age of 20 he constructed a laboratory for himself at his home.

2. He turned his attention to the problems of agricultural chemistry when a neighbour pointed out to him that on some local farms bone meal increased turnip production, while on others it seemed to have no effect. This started him on his life's work, the chemistry of fertilizers.

3. After experimentation, Lawes showed that it was necessary to make the phosphate in the bones more readily soluble in the soil for absorption by plants. This he achieved by adding sulfuric acid to the crushed bones. Lawes took out a patent on these 'superphosphates' in 1842, opening his first factory for their production in 1843. By the 1870s he was producing 40,000 tons of superphosphates a year using phosphate rock rather than bones.

4. Also in 1843, Lawes was joined by Henry Gilbert, beginning a lifelong collaboration, and he started the Rothamsted Experimental Station[5], the first agricultural research station in the world. Experiments were conducted on different fertilizers; crops which were normally grown in rotation were grown here year after year on the same plot using a variety of manures and fertilizers. Animal feed was also examined and varied to find the most economical and efficient. Well over 100 papers were produced by Lawes and Gilbert on their Rothamsted work.

5. Lawes established the Lawes Agricultural Trust in 1889 to safeguard the continuation of research following his death. He was created a baronet[6] in 1882.

NOTES

[1] **Harpenden** – Харпенден, небольшой город

[2] **Hertfordshire** ['hɑ:(t)fədʃɪə] – Хартфордшир, графство Англии

[3] **Eton** ['i:tn] – Итон, Итонский колледж, частная британская школа для мальчиков

[4] **Oxford University** – Оксфордский университет

[5] **Rothamsted Experimental Station** – экспериментальная станция Ротамстеда (затем – Институт исследования сельскохозяйственных культур), ведущий центр сельскохозяйственных исследований, один из старейших сельскохозяйственных научно-исследовательских институтов в мире, основана в 1843 г.

[6] **baronet** ['bærənɪt,-net] – баронет (титул); *He was created a baronet.* – Он получил титул баронета

Some Useful Vocabulary

crushed bones – измельченные кости
estate [ɪ'steɪt] – поместье, земельное владение
following his death – после его смерти
lord of the manor ['mænə] – барин, владелец поместья
safeguard – обеспечить, гарантировать, сохранить
sulfuric [sʌl'fjʊərɪk] *acid* – серная кислота

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Костная мука; 2) удобрения; 3) легкорастворимый; 4) почва; 5) рудный фосфат / фосфоритная руда; 6) сотрудничество; 7) севооборот; 8) участок земли; 9) навоз / органическое удобрение; 10) научные исследования / научно-исследовательская работа.

Task 2. Match English phrases with their Russian equivalents, and then complete the sentences with these word combinations.

1) developed an interest in	a) был рассмотрен/изучен
2) was educated	b) достигать
3) inherit	c) обратить внимание на
4) take a degree	d) получил образование
5) turn one's attention to	e) получить патент на
6) achieve	f) получить ученую степень
7) conduct experiments	g) проводить эксперименты
8) was examined	h) проявил интерес к
9) take out a patent on	i) создать/учредить/установить
10) establish	j) унаследовать

1. They _____ to determine the viscosity (вязкость) of motor oil.
2. You once told me you would like to _____ in philosophy.
3. In his teens, he _____ astronomy and aviation and became a pilot.
4. Each sample _____ through a microscope.
5. In 2001, GCC countries agreed to _____ a unified customs tariff of five per cent as of 1 January 2003. (*GCC =Gulf Cooperation Council – Совет по сотрудничеству стран Персидского зал*ива)
6. In some countries women cannot _____ land either from their husbands or their parents.
7. I wanted her to _____ her _____ her future, not the past.
8. He _____ at Harrow School and the Royal Agricultural College.
9. She was unable to _____ her aims.
10. He wants to _____his new type of dustbin.

Task 3. Complete the sentences using the words from the text.

1. Lawes was the _____ son of the lord of the Manor.
2. He _____ his father's _____ in 1822.
3. He was _____ at Eton and Oxford _____.
4. He left the university without _____ _____.
5. He _____ _____ in science, particularly, _____.
6. At the age of 20 he constructed a _____ for himself _____.
7. Once a neighbour pointed out to him that on some _____ _____ bone meal increased _____ production.
8. Lawes turned his _____ to the problems of _____ _____, in particular, the chemistry of _____.
9. Lawes showed that it was _____ to make the _____ in the bones more _____ _____ in the soil for absorption by _____.
10. He achieved this by adding _____ ____ to the _____ _____.
11. In 1842 Lawes opened his first _____ for the production of _____.
12. Later, he used _____ _____ rather than _____ to produce 40,000 tons of _____ a year.
13. In 1843 Lawes started the _____ _____ _____, the first _____ _____ ____ in the world.
14. In 1889 he _____ the Lawes Agricultural Trust to _____ the continuation of _____ following his death.

Task 4. Work in pairs. Ask and answer the questions.

1. What family was John Bennet Lawes born into?
2. What did he inherit from his father?

3. Where did he get his education?
4. What degree did he obtain?
5. What subject did he get interested in?
6. What did he construct at home?
7. What made Lawes pay attention to the agricultural chemistry?
8. What problems of agricultural chemistry did he work on?
9. What did his experimentation result in?
10. What did Lawes produce his superphosphates from?
11. Who did Lawes start to collaborate with in 1843?
12. What research centre did he found that same year?
13. What kind of experiments were conducted there?
14. Why did Lawes establish the Lawes Agricultural Trust in 1889?
15. When did he die?

Task 5. Complete the table.

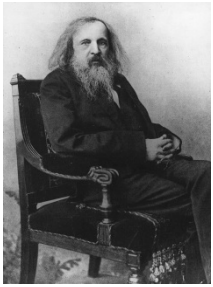
1984	was born
1822	inherited his father's estate
?	constructed laboratory at home
1842	?
?	opened his first factory for superphosphate production
?	started the Rothamsted Experimentation Station
1870s	?
1882	was created a baronet
1889	?
1900	died

Task 6. Match the sentence halves.

1. Sir John Bennet Lawes	
2. He founded the artificial	a) fertilizer industry in Britain.
3. Lawes studied the effects	b) is an English agronomist.
4. He patented a process for treating phosphate rock	c) joined him.
	d) more than half a century.
5. In 1843 the chemist J.H. Gilbert	e) of different fertilizers on crops.
	f) of manures on potted plants and field crops on his estate.
6. Their collaboration lasted	g) the value of different fodders.
7. Together, the pair studied the effects	h) with sulfuric acid to produce superphosphate.
8. They also researched animal nutrition, including	

UNIT 9

Mendeleev, Dmitri Ivanovich
(1834–1907)
Russian Chemist



1. Mendeleev was the youngest child of a large family living in Tobolsk, Siberia. His father was a local school teacher whose career was ended by blindness and to support the family his mother, ran a glass factory. Mendeleev learned some science from a political refugee who had married one of his sisters. His father died in 1847, and soon after his mother's factory was destroyed by fire. She left Tobolsk with Mendeleev, determined that her last son should receive a good education, and placed him at the Pedagogic Institute of St. Petersburg only ten weeks before her death. He later studied in France under Henri Regnault[1] and in Heidelberg[2] with Robert Bunsen[3] and Gustav Kirchhoff[4].

2. While abroad Mendeleev attended the famous conference at Karlsruhe[5] in 1860 which did so much to settle the question of atomic weights. He returned to Russia shortly after and in a short time had completed his doctorate, written a textbook, and married. In 1866 he was elected to the chair of chemistry at St. Petersburg University where he remained until his retirement in 1890. His textbook *The Principles of Chemistry (Основы химии)* was published between 1868 and 1870.

3. In 1869 Mendeleev published his classic paper *On the Relation of the Properties to the Atomic Weights of Elements*[6], which brought order and understanding to this confused subject. His first major proposal was his claim that the only way of classifying the elements is by their atomic weights. Optical, magnetic, and electrical properties vary with the state the body is in at any particular moment; other properties, such as valence, yield conflicting results. When the elements are arranged in order of increasing atomic weight, Mendeleev found that they show a distinct periodicity of their properties. Arranging them in rows of increasing atomic weights produced columns of similar elements.

4. The table did not at first receive universal acceptance, but its value became apparent during the following 20 years. Through it Mendeleev was able to spot those elements that had been assigned incorrect atomic weights. Thus he suggested that the atomic weights of gold and tellurium must be

wrong. There were three missing elements in his table, and he was able to predict their existence, valences, and certain physical properties. The three were eventually discovered 'eka-aluminum'[7] (gallium, Paul Lecoq de Boisbaudran[8], 1875), 'eka-boron' (scandium, Lars Fredrick Nilson[9], 1879), and 'eka-silicon' (germanium, Clemens Winkler[10], 1885).

5. Mendeleev became the most famous Russian scientist of his day and received numerous medals and prizes although not, surprisingly, the Nobel Prize (in 1906 it was awarded to Ferdinand Moissan[11] by one vote). Element 101 was named *mendelevium* in his honor.

NOTES

[1] **Henri Regnault** – Анри Виктор Реньо (1810–1878), французский химик и физик, автор получившего широкое распространение учебника «Начальный курс химии»

[2] **Heidelberg** – г. Гейдельберг, Германия

[3] **Robert Bunsen** – Роберт Вильгельм Бунзен (1811–1899), немецкий химик-экспериментатор

[4] **Gustav Kirchhoff** – Густав Кирхгоф (1824–1887), немецкий физик.

[5] **Karlsruhe** – г. Карлсруэ, Германия

[6] **On the Relation of the Properties to the Atomic Weights of Elements** – «Соотношение свойств с атомным весом элементов»

[7] **eka**- – эка-(/*санскр*./ = один, *зд*. в смысле первого аналога) введенное Д. И. Менделеевым обозначение неизвестных еще в его время и предсказанных им химических элементов, расположенных в периодической таблице под соответствующими известными. Позже все такие экаэлементы были открыты: экаалюминий (1875) назван галлием, экабор (1879) – скандием, экасилиций (1886) – германием

[8] **Paul Lecoq de Boisbaudran** – Лекок де Буабодран (1838–1912), французский химик, первооткрыватель предсказанного Менделеевым галлия

[9] **Lars Fredrick Nilson** – Ларс Фредрик Нильсон (1840–1899), шведский химик, открывший в 1879 г. скандий

[10] **Clemens Winkler** – Клеменс Александр Винклер (1838–1904), немецкий химик, открывший химический элемент германий в 1885 г.

[11] **Ferdinand Moissan** – Фердинанд Анри Муассан (1852–1907), французский химик, Нобелевская премия по химии (1906)

Some Useful Vocabulary

atomic weight [weit] – атомный вес
complete one's doctorate – получить степень доктора, защитить докторскую диссертацию
in order of – по порядку, в порядке
run a factory – управлять фабрикой, руководить предприятием
settle the question – решить вопрос
spot – обнаружить, распознать, установить, идентифицировать
tellurium [tə'l(j)u(ə)riəm] – теллур
valence [´veiləns] – валентность
yield results – давать результаты

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Слепота; 2) политэмигрант, беженец; 3) пожар; 4) вскоре после этого; 5) свойства; 6) отставка / выход на пенсию; 7) валентность; 8) всеобщее признание; 9) существование; 10) таблица.

Task 2. Match the sentence halves.

1. His father was	a) a good education.
2. His mother	b) a school teacher
3. Mendeleev received	c) apparent during the following 20 years.
4. In Europe he studied	d) at St. Petersburg University.
5. In 1860 Mendeleev attended	e) his doctorate.
6. Back in Russia in short time he completed	f) ran a glass factory.
7. Then he became a professor	g) receive universal recognition.
8. He remained at the chair of chemistry	h) the famous conference in Karlsruhe.
9. The first draft of Mendeleev's periodic table	i) under a well-known French chemist.
10. Mendeleev's periodic table of elements	j) until his retirement in 1890.
11. At first Mendeleev's table did not	k) was based on atomic weight.
12. The value of the table became	l) was proposed in his classic paper in 1869.

Task 3. Match adjectives with nouns, and then their Russian equivalents. Complete the sentences below with these word combinations.

1) political	a) acceptance	атомный вес
2) atomic	b) elements	важное предложение
3) classic	c) moment	всеобщее признание
4) major	d) paper	данный момент
5) electrical	e) periodicity	классическая работа
6) particular	f) properties	недостающие элементы
7) conflicting	g) proposal	отчетливая периодичность
8) distinct	h) refugees	политэмигранты/беженцы
9) universal	i) results	противоречивые результаты
10) missing	j) weights	электрические свойства

1. Research has produced _____.
2. Chemists had a way of measuring _____ accurately.
3. In Henry Mosley's _____ on atomic numbers, holmium (гольмий,) was assigned an atomic number of 66.
4. Owing to their shortcomings, these initiatives have failed to achieve _____ and legitimacy.
5. All _____ in this table are either not metals or have a negative standard potential.
6. Mendeleev found that the elements show a _____ of their properties.
7. A _____ in this draft is the establishment of an anti-corruption commission, which would have investigative and prosecutorial powers.
8. The country has accepted _____, mostly from Cuba.
9. At this _____ she felt she'd never experience such happiness again.
10. Neither mechanical nor _____ of lead ([led] свинец) or of its alloys are of commercial interest.

Task 4. Answer the questions.

1. What family was Mendeleev born into?
2. What was his father? When did he die?
3. What did his mother do? Why?
4. What happened to the glass factory?
5. What education did Mendeleev receive? Where?
6. What European countries did he study in?
7. What conference did he attend in 1860?
8. Why was the conference of great importance?

9. What did Mendeleev do when he returned to Russia?

10. Where did Mendeleev work? How long did he work there?

11. What textbook did he have published in the late 1860?

12. What was the title of his classic paper published in 1869?

13. What did he propose in the article?

14. Why did Mendeleev claim that the atomic weight of the elements was the best classification criteria for them?

15. What was the advantage of the periodic table?

16. What discoveries did he make through his periodic table?

17. What was he awarded with for his outstanding achievements in science?

Task 5. Rad the text and find there English equivalents of the following words and phrases.

1) плодовитый мыслитель и автор; 2) многочисленные неопубликованные рукописи; 3) еще в (… году); 4) распространение научно-технических знаний; 5) разработка сельскохозяйственных и промышленных ресурсов; 6) одна из главных забот; 7) угольная промышленность; 8) нефтяная промышленность; 9) в общей сложности / в общем и целом; 10) теоретическая химия.

Activities beyond chemistry

Mendeleev carried on many other activities outside academic research and teaching. He was one of the founders of the Russian Chemical Society (now the Mendeleev Russian Chemical Society) in 1868 and published most of his later papers in its journal. He was a prolific thinker and writer. His published works include 400 books and articles, and numerous unpublished manuscripts are kept to this day in the Dmitri Mendeleev Museum and Archives at St. Petersburg State University. In addition, in order to earn money he started writing articles on popular science and technology for journals and encyclopaedias [ɪn'saɪklə'pi:dɪəz] as early as 1859. His interest in spreading scientific and technological knowledge was such that he continued popular science writing until the end of his career, taking part in the project of the *Brockhaus Enzyklopädie*[1] and launching a series of publications entitled *Biblioteka promyshlennykh znany* (“Library of Industrial Knowledge”) in the 1890s.

Another interest, that of developing the agricultural and industrial resources of Russia, began to occupy Mendeleev in the 1860s and grew to become one of his major preoccupations. He wrote projects to develop a

coal industry in the Donets Basin[2], and he traveled to both Baku in Azerbaijan (then part of the Russian Empire) and to Pennsylvania[3] in the United States in order to learn more about the petroleum industry. All told, he may have devoted more time to questions of national economy than to pure chemistry.

---

[1] **Brockhaus Enzyklopädie** – «Энциклопедический словарь Брокгауза и Ефрона», универсальная энциклопедия на русском языке, изданная в Российской империи акционерным издательским обществом Ф. А. Брокгауз – И. А. Ефрон в 1890–1907 годах

[2] **Donets Basin** – Донбасс, Донецкий угольный бассейн

[3] **Pennsylvania** ['pensɪl'veɪnɪə] – Пенсильвания, штат США

Task 6. Answer the questions about the text.

1. Why is Mendeleev considered to be a prolific thinker and writer?
2. Where did he publish his works?
3. What were the reasons for him to start writing articles on popular science and technology?
4. What interest began to occupy Mendeleev in the 1860s?
5. What projects did he devote time to?

Task 7. Read and then translate the text.

Mendeleev Dmitry Ivanovich (1834–1907), the great Russian chemist, devoted much of his work to research in agriculture, animal husbandry, land reclamation, forestry, and the processing of agricultural products. He identified four conditions of modern agriculture:

1. availability of profitable breeds of animals and varieties of plants;
2. the realization of the marketing of products as a commodity;
3. the development of specializations;
4. reducing the cost of physical labour by replacing it with machines.

D.I. Mendeleev attached great importance to the intensification of arable farming, the use of deep plowing for the use of nutrients in the subsoil layers, the use of fertilizers. He believed that it was possible to achieve high efficiency of agriculture only with a developed industry producing a sufficient number of modern machines, implements, mineral fertilizers. Agriculture needs much more capital than any other sector of the economy.

Task 8. In the following pairs of sentences you will need two forms of the same word. Use different forms of the words in this box to complete the sentences below.

different explain difficult argue believe develop

1. Supporters of Darwin's theories *believe* that human life evolved gradually over millions of years. This *belief* is strongly opposed by creationists.

2. The secretary _____ the registration process in some detail. However, the _____was rather complicated and several people failed to understand.

3. People react in _____ ways to dangerous situations. These _____ cannot simply be attributed to psychological factors

4. There is a strong _____ that there is a link between violent computer games and violent behaviour. The manufacturers of such games _____ that their products do not influence people's behaviour, however.

5. Some elderly people find pre-packaged foods _____ to open. The main _____ is that some of the materials used in packaging are quite tough.

6. Many studies have recorded how young children's language skills _____ . The _____ of second-language skills in children is also of great interest to researchers.

Task 9. Fill in the gaps with the words from the box.

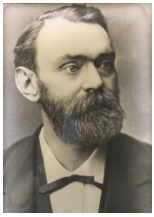
agricultural topics private house quality summer seasons garden agriculture Periodic table agrochemical mineral

In June 1865 Mendeleev bought a 1) _____ in the village of Boblovo (12 km from the town of Klin, Moscow region), and his family started to spend 2) _____ in the countryside. Mendeleev built a new house (with a laboratory), and equally enjoyed working both in the lab and in the 3) _____. In the village Mendeleev's interest in 4) _____ fully flourished. Mendeleev was fond of modern 5) _____ ideas (particularly those of *Liebig*, who urged to use phosphorites and other 6) _____ fertilizers in agriculture) and decided to test them experimentally. For this purpose he ran in Boblovo experimental fields and a farm. Mendeleev behaved very actively: he gave a lecture at the Imperial Free Economic Society on 7) _____, became its member, received support from the Society for his experiments in Boblovo, and within two years, indeed, succeeded in improving the 8) _____ of his soils and the yield of crops. He was so deeply involved in the Economic Society's activities that later in 1869, on the day of the first presentation of his 9) _____ to the Russian Chemical Society, he went on the inspection trip to a cheese dairy and therefore asked N. Menshutkin to stand in for him at the talk.

Liebig – Ю́стус фон **Ли́бих**, немецкий учёный, внёсший значительный вклад в развитие органической химии, один из основателей агрохимии и создателей системы химического образования.

UNIT 10

Nobel, Alfred Bernhard
(1833–1896)
Swedish Chemist, Engineer, and Inventor



1. Nobel left Stockholm[1], where he was born, in 1842 to join his father, an engineer, who had moved to St Petersburg. He was taught chemistry by his tutors and spoke fluently in English, French, German, Swedish, and Russian. In 1850 he went to Paris[2] to study chemistry and then went on to America for four years, before returning to work in his father's factory in St. Petersburg.

2. In 1859 Nobel moved back to Sweden[3] and set up a factory there (1864) to make nitroglycerin[4], a liquid explosive. After an explosion at the factory in 1864 in which his brother, Emil, and four others were killed, the Swedish[3] government would not allow the factory to be rebuilt. Nobel then started to experiment to find a more stable explosive. Discovering that nitroglycerin was easily absorbed by a dry organic packing material, he invented dynamite and the detonating cap. These were patented in 1867 (UK) and 1868 (Unites States). From such work and from oil fields in Russia that he owned, Nobel amassed a vast fortune. He traveled widely and was a committed pacifist. He left the bulk of his money in trust for international awards – the Nobel Prizes for peace, literature, physics, chemistry, and medicine. The Nobel Prize for economics was introduced in his honor in 1969 and financed by the Swedish National Bank.

NOTES

[1] **Stockholm** ['stɒkhəʊm] – г. Стокгольм, столица Швеции
[2] **Paris** ['pærɪs] – г. Париж, столица Франции
[3] **Sweden** ['swiːdn] – Швеция, **Swedish** ['swiːdɪʃ] – шведский
[4] **nitroglycerin** [naitrəʊ'glisərin] – нитроглицерин

Some Useful Vocabulary

amass [ə'mæs] – накопить, собрать
bulk of – основная/б**о**льшая часть (чего)
dynamite ['daɪnəmaɪt] – динамит
fluently ['fluːəntli] – бегло

in trust for – в порядке доверительного управления, по доверенности в интересах (чего)

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Домашний учитель; 2) жидкое взрывчатое вещество; 3) взрыв на фабрике; 4) сухой органический сорбент / наполнитель; 5) детонатор / подрывной капсюль; 6) нефтепромыслы; 7) сколотить огромное состояние; 8) объехал много стран / много путешествовал; 9) убежденный пацифист / миротворец; 10) бо**о**льшая часть денег; 11) оставить в доверительное управление; 12) шведское правительство; 13) международная премия; 14) Нобелевская премия мира.

Task 2. Complete the sentences using the words from the text.

1. Alfred Nobel was born in _____ in_____.
2. His father was an _____.
3. In _____ Alfred Nobel _____ Stockholm in order to _____ his father in _____.
4. In 1850 he went to _____ to study _____.
5. He lived in America for _____ and then he _____ to Russia to work in _____ _____ in St. Petersburg.
6. In 1859 Nobel _____ _____ to Sweden.
7. He set up a _____ there to make _____.
8. In 1864 there was an _____ at the factory in which his _____ and _____ others _____ _____.
9. The Swedish _____ wouldn't allow _____ to be rebuilt.
10. Nobel started to _____ to find a _____ _____ _____.
11. He discovered that nitroglycerin was easily _____ by a _____ _____ _____ _____.
12. Alfred Nobel invented _____ and the _____ _____.
13. He patented them in _____ (in 1867) and in the _____ _____ (in 1868).
14. Nobel amassed a _____ _____ from such _____ and from _____ _____ in _____ that he _____.
15. Nobel travelled _____ and was a _____ _____.
16. He left _____ of his _____ for _____ _____.
17. The Nobel Prizes are awarded annually in the fields of _____, _____, _____, _____ and _____.
18. The Nobel Prize for _____ was _____ in his _____ in 1959.

Task 3. Match the words with their definitions.

	a) one who loves, supports, or favours peace;
	b) area where petroleum is or was removed from the Earth;
1) award	c) lots of riches;
2) dynamite	d) type of powerful explosive;
3) explosive	e) substance with the capability to, or likely to explode;
4) fortune	
5) invent	f) violent release of energy (sometimes mechanical, nuclear or chemical);
6) oil field	
7) pacifist	g) trophy or a medal, something that denotes an accomplishment, especially in a competition;
8) patent (v)	
9) explosion	h) one who gives private instruction to a single pupil or a very small class;
10) tutor	
	i) successfully register an invention with a government agency;
	j) create something fictional for a particular purpose, to design a new process or mechanism.

Task 4. Complete the sentences with the words from task 3. Sometimes you need to change the form of the word.

1. Science is advanced then, so they _____ a time machine.
2. I really think you deserved this _____.
3. Alfred Nobel invented _____ and instituted the Nobel Prizes.
4. Many states have introduced measures to combat illegal immigration and trafficking in arms and _____ .
5. A gas leak caused the _____.
6. Her father engaged a _____ to improve her maths.
7. Should I _____ this invention?
8. He hoped to achieve fame and _____.
9. It is named after the political activist and _____ Mahatma Gandhi.
10. This is a cattle ranch, not an _____.

Task 5. Answer the questions about the text.

1. What is Alfred Nobel?
2. Where and when was he born?
3. What was his father?
4. Why did he move to St. Petersburg?
5. What languages did A. Nobel speak?

6. Where did he study chemistry?
7. How long did he study in America?
8. Why did he come to Russia?
9. When did A. Nobel move to back to Sweden& Why?
10. What is nitroglycerin?
11. What happened at the factory in 1864?
12. Why wasn't the factory rebuilt?
13. What was Nobel engaged in after the explosion?
14. What did he discover?
15. What did he invent?
16. Where and when did he patent his inventions?
17. How did he amass a vast fortune?
18. What kind of person was he?
19. What did he do with his money?
20. When and why was the Nobel Prize for economics introduced?

Task 6. Choose the best option to complete the sentences.

Science and inventions

Nobel left France for the USA 1) ***to collaborate*** **/** ***to argue*** with the American researcher of the Swedish origin John Ericsson, who created the civil-war participant USS Monitor[1] and studied solar energy 2) ***priorities*** **/** ***properties***. The young student 3) ***conducted*** **/** ***concluded*** many chemical and physical experiments under his mentor's guidance.

As long as Nobel returned to Stockholm, he did not stop working; he was looking for an active 4) ***suspect*** **/** ***substance*** that could reduce the explosive hazard level of glyceryl trinitrate[2]. One of the experiments ended up with a tragedy: there was an 5) ***explosion*** **/** ***explosive*** at one of the Nobel's plants on September 3, 1864; several people, including Alfred's brother Emil, died. The young man had just turned 20. The father could not stand it and had a heart attack; he passed away soon.

The next month after the incident, Alfred received a 6) ***potent*** **/** ***patent*** on nitroglycerine; he continued with the licenses on dynamite, gelatine-dynamite detonator, and other 7) ***explosions*** **/** ***explosives***. The scientist was equally successful in practical facilities: fridge, steam generator, gas burner, barometer, and hydrometer. It was Nobel who developed the chemical composition of artificial silk and cellulose nitrate. Overall, he could boast 355 8) ***inventors*** **/** ***inventions*** in biology, chemistry, optics, medicine, and metallurgy [mi'tæləʤi, 'meʈlɜːrʤi].

To popularize each 9) ***inventor*** **/** ***invention***, the scientist organized 10) ***presents*** **/** ***presentations*** and showed how a new instrument or substance worked. Such events were immensely popular among the amateurish[3] public, as well as Nobel's colleagues and friends.

Alfred Nobel died of a stroke on December 10, 1896, in San Remo, Italy. The first Nobel Prizes were awarded in 1901, 5 years after his death. The synthetic element *nobelium* is named after him. The Monument to Alfred Nobel was created in his honor in Saint Petersburg.

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[1] **USS Monitor** – первый броненосец ВМС США, знаменитый прежде всего своим участием в первой в истории морских сражении битве броненосцев: битве у Хэмптон Роудс 9 марта 1862 года в ходе Гражданской войны в США. (USS = United States Ship, корабль ВМС США)

[2] **glyceryl trinitrate** – тринитрат глицерина

[3] **amateurish** ['æmətərɪʃ] – любительский, непрофесиональный

Task 7. Decide if the statements are TRUE or FALSE. Correct false statements.

1. Nobel came to France from the USA.
2. His scientific adviser was an American scientist.
3. John Ericsson was a Swedish-American inventor and mechanical engineer.
4. Ericsson designed the USS Monitor, an armored ship.
5. USS Monitor played an important role in the American Civil War.
6. Nobel also worked on naval vessels and weapons under Ericsson's guidance.
7. Alfred Nobel experimented with the ways to decrease the explosive hazard level of glyceryl trinitrate.
8. Alfred's father died in the explosion.
9. Alfred Nobel invented lots of other things, not only explosives.
10. Nobel died in Sweden, in his native town.

Task 8. Insert prepositions.

1. He was taught chemistry _____ his tutors.
2. Alfred spoke fluently _____ many languages.
3. _____ 1850 he went _____ Paris to study chemistry
4. Then Alfred Nobel went on _____ America _____ four years.
5. ___ 1864 his brother was killed ___ the explosion _____ the factory.
6. Nobel amassed a vast fortune _____oil fields ___ Russia.
7. He left the bulk ___ his money ___ trust ___ international awards.

UNIT 11

John Deere
(1804–1886)
American Inventor and Manufacturer of Agricultural Implements.

1. John Deere was a pioneer American inventor and manufacturer of agricultural implements.

2. Apprenticed to a blacksmith at age 17, Deere set up his own smithy trade four years later and, for 12 years, did work in various towns of his native Vermont[1]. In 1837, when 33 years old, he headed west and eventually settled in Grand Detour, Illinois[2], where he set up a blacksmith's shop, and sent for his wife and children the following year. He joined in a partnership with Major Leonard Andrus.

3. In his work, Deere found, through the frequent repairs that he had to make, that the wood and cast-iron plow, used in the sandy soils of the eastern United States from the 1820s, was not suited to the heavy, sticky soils of the prairies. Calculating that an answer lay in an all-steel one-piece share and moldboard, he began experimenting, and by 1838 he and his partner had sold three newly fashioned plows. He kept experimenting, producing 10 improved plows in 1839 and 40 new plows in 1840. By 1846 the annual output was about a thousand plows. Deciding that Grand Detour was not well situated in regard to transportation and resources, Deere sold his interest in the shop to Andrus in 1847 and moved to Moline, Illinois. There he began using imported English steel with great success and soon negotiated with Pittsburgh manufacturers for the development of comparable steel plate. By 1857 Deere's annual output of plows had risen to 10,000.

4. In 1858 Deere took his son Charles into partnership and in 1863 his son-in-law, Stephen H. Velie; in 1868 the firm was incorporated as Deere & Company. Deere remained president of the company for the rest of his life. Gradually Deere & Company began manufacturing cultivators and other agricultural implements. It is still a major American manufacturer of farm machinery and industrial equipment. Still headquartered in Moline, Illinois, it witnessed five generations of Deere family leadership from its inception until 1982.

NOTES

[1] **Vermont** [vɜ:'mɔnt] – Вермонт, штат США
[2] **Illinois** ['ılı'nɔı] – Иллинойс, штат США
[3] **Pittsburgh** ['pıtsbɜ:g] – г. Питтсбург

Some Useful Vocabulary

agricultural implements – сельскохозяйственная техника, сельскохозяйственные орудия
apprentice [ə'prentıs] – (*n*) ученик, подмастерье; (*v*) отдавать в ученье, быть подмастерьем, учиться ремеслу
blacksmith ['blæksmıθ] – кузнец
cast-iron ['kɑ:st¸aıən] – чугун
inception [ın'sepʃ(ə)n] – начало, зарождение
incorporate [ın'kɔ:p(ə)rıt] – регистрировать, оформлять в качестве юридического лица
moldboard ['məʊldbɔ:d] – отвал плуга
share – лемех (плуга), сошник
smithy ['smıðı] *trade* – кузнечное дело / ремесло

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Производитель сельскохозяйственных орудий; 2) кузнечная мастерская / кузница; 3) частые ремонтные работы; 4) плуг, сделанный из дерева и чугуна; 5) песчаные формы; 6) тяжелые вязкие (липкие) почвы; 7) стальной неразъемный лемех и отвал плуга; плуг из одного куска стали, с неразъемными лемехом и отвалом; 8) плуги нового образца; 9) улучшенный плуг; 10) годовой объем производства; 11) производители / заводчики; 12) соответствующая стальная пластина; 13) сельскохозяйственная техника; 14) промышленное оборудование.

Task 2. Complete the sentences with the words from the text.

1. At the age of 17 he was apprenticed to a _____.
2. Four years later he set up his own _____ _____.
3. When he was 33 years old, he headed _____.
4. In Grand Detour he _____ a _____ _____.
5. There he had to make _____ _____.
6. From the 1820s farmers used the _____ and _____ _____ in the sandy soils of the western United States.
7. This plow was not suited to _____ _____ soils of prairies.

8. So John Deere devised a new plow with _____ _____ _____ and _____.

9. By 1838 he and his partner had sold three _____ _____ _____.

10. In1839 10 _____ _____ were produced.

11. By 1846 the _____ _____ was about 1,000 plows.

12. In Moline John Deere began using imported English steel _____ _____ _____.

13. Soon he negotiated with Pittsburg manufacturers for the development of _____ _____ _____.

14. By 1857 Deere's annual output of plows had risen to _____.

15. Deere remained president of the company for ____ ____ ____.

16. Gradually Deere & Company began manufacturing _____ and other _____ _____.

17. It is still a major American manufacturer of _____ _____ and _____ _____ .

18. The company is headquartered ___ _____.

Task 3. Answer the questions about the text.

1. What is John Deere?
2. Where was he born?
3. What education did he get? Where was he educated?
4. What did he do after finishing his apprenticeship?
5. Where did he work in Vermont?
6. Where did he move to in 1837?
7. What did he set up there?
8. What observations did he make while working in Grand Detour?
9. What solution to the problem did he come up with?
10. Why did John Deere eventually leave Grand Detour? Where did he move to?
11. How did he start his business in Moline?
12. Did he succeed in manufacturing agricultural implements?
13. What changes took place in the company in 1858 and in 1868?
14. What position did he hold in the company?
15. What does Deere & Company manufacture?
16. Where is it based?

UNIT 12

Ian Wilmut
(1944 –)
English Embryologist and Genetic Engineer

1. Sir Ian Wilmut is an English developmental biologist who was the first to use nuclear transfer of differentiated adult cells to generate a mammalian clone, a Finn Dorset sheep[1] named Dolly, born in 1996.

2. Wilmut was raised in Coventry[2], a town in the historic English county of Warwickshire[3], and he attended the Agricultural College at the University of Nottingham[4]. In his undergraduate studies, Wilmut initially pursued his lifelong interest in farming, particularly in raising animals such as sheep. However, he soon turned his attention to animal science and basic research. In 1966, his final year at Nottingham, he received a scholarship to conduct research for a summer under English biologist Ernest John Christopher Polge[5] in the Unit of Reproductive Physiology and Biochemistry[6], then a division of the Agricultural Research Council[7] at the University of Cambridge. During this time, Wilmut performed basic experiments on animal embryos. Following his graduation from Nottingham in 1967, he returned to Cambridge, where he pursued a doctorate under the guidance of Polge, whose research was focused on improving methods of embryo cryopreservation. In 1971 Wilmut was awarded a doctorate by Darwin College[8], Cambridge; the title of his thesis was "Deep Freeze Preservation of Boar Semen." Wilmut remained at Cambridge and conducted extensive research on the cryopreservation of embryos. In 1973 he successfully implanted into a surrogate cow a calf embryo that had been cryopreserved. The embryo was carried to term, and Wilmut named the first-ever "frozen calf " Frostie.

NOTES

[1] **Finn Dorset sheep** – овца скрещенной породы Финская Дорсет (Финская порода овец *x* порода Дорсет)

[2] **Coventry** – г. Ковентри

[3] **Warwickshire** ['wɔrɪkʃɪə] – графство Уорикшир

[4] **University of Nottingham** ['nɔtɪŋəm] – Ноттингемский университет, один из крупнейших и престижных университетов Великобрита-

нии и мира, государственный исследовательский университет, находится в г. Ноттингеме, Англия

[5] **Ernest John Christopher Polge** – Кристофер Польже (1926–2006), английский биолог, наиболее известный своими работами в области криоконсервации

[6] **Unit of Reproductive Physiology and Biochemistry** – отделение (кафедра?) физиологии воспроизводства и биохимии

[7] **Agricultural Research Council** – Совет по сельскохозяйственным исследованиям

[8] **Darwin College** – Колледж Дарвина, один из колледжей Кембриджского университета. Он стал первым смешанным (принимали и мужчин, и женщин) и первым рассчитанным на людей с высшим образованием колледжем

Some Useful Vocabulary

developmental biologist – биолог-эволюционист

nuclear transfer – перенос ядра

differentiated adult cell – дифференцированные соматические клетки у взрослых особей / дифференцированные взрослые клетки

mammalian clone – клон / точная копия млекопитающего

undergraduate studies – бакалавриат, базовое высшее образование

pursue [pə'sju:] *interest in farming* – проявлять интерес к сельскому хозяйству

pursue a doctorate – учиться в докторантуре, защитить докторскую диссертацию

carry to term – выносить (ребенка) до положенного срока

Task 1. Find in the text the English equivalents of the following words and phrases.

1) Разведение животных; 2) зоотехния; 3) фундаментальные / теоретические исследования; 4) получить стипендию; 5) проводить исследования; 6) готовиться к защите докторской диссертации по руководством (кого); 7) улучшение методов криоконсервации эмбрионов (сохранения эмбрионов путем их переохлаждения); 8) получить докторскую степень; 9) тема диссертации; 10) обширные исследования, 11) эмбрион теленка.

Task 2. Complete the sentences with the words from the text.

1. Ian Wilmut was born in _____.

2. He _____ _____ in Coventry.
3. He _____ the Agricultural College at the University of Nottingham.
4. Initially he _____ his lifelong _____ in farming.
5. Soon he turned his _____ to animal science and _____ _____.
6. He received a _____ to _____ _____ for a summer.
7. During this time, Wilmut _____ basic experiments on _____ _____.
8. Following his graduation from Nottingham, he pursued a doctorate ___ the _____ of Polge at Cambridge University.
9. Wilmut was _____ _____ by Darwin College in 1971.
10. The _____ of his _____ was "____ ____ _____ of Boar Semen".
11. Wilmut remained at Cambridge and _____ _____ _____ on cryo-preservation of embryos.

Task 4. Match and translate the word combinations.

1) to use	a) a calf embryo into a surrogate cow
2) to generate	b) a doctorate
3) to attend	c) a mammalian clone
4) to pursue	d) a scholarship
5) to turn	e) at Cambridge
6) to receive	f) basic experiments
7) to conduct	g) nuclear transfer
8) to perform	h) one's attention to
9) to return	i) one's interest in farming
10) to be awarded	j) research
11) to remain	k) the college
12) to implant	l) to Cambridge

Task 5. Answer the questions about the text.

1. What is Ian Wilmut? What is he famous for?
2. Why did he go to Agricultural College?
3. How did he spend his summer in 1966?
4. What kind of experiments did he perform during this time?
5. What did he do after his graduation from Nottingham?
6. Who was his thesis adviser?
7. What research did Christopher Polge conduct?
8. When and where did Ian Wilmut earn his PhD degree?
9. What was his thesis devoted to?
10. What experiment did he perform in 1973?
11. Why did Wilmut call the calf Frostie?

POSTGRADUATE STUDIES

Task 1. Learn the words. Read the examples. Think of your own examples with these words.

abstract of thesis (article) автореферат диссертации (статьи)

Every postgraduate has to write abstract of thesis before the thesis. The abstract of thesis is published or presented online.

adviser, *n* 1 куратор 2 научный руководитель

The adviser has to manage the process of the research and defense. Highly-qualified adviser is very important for each postgraduate student and candidate for Master's degree.

adviser-consultant, *n* 1 эксперт 2 советник-консультант

Each adviser is at the same time adviser-consultant. Mr. Smith is my adviser-consultant. In my opinion, he is the best consultant in University.

assistant professor, *n* доцент (учёное звание ниже, чем **associate professor**)

The assistant professor position means the scientific work activity and prosecution of research. Assistant professors carry out the scientific work of their own.

associate professor, *n* 1 доцент университета 2 адъюнкт-профессор

The associate professor position is higher than that of the assistant professor. Associate professors carry out the scientific work of their own and guide postgraduate studies and their scientific research.

candidate for Master's degree кандидат на соискание учёной степени магистра

Candidates for Master's degree take the course of studies after four years of university studies and graduation. In two years they will get the Master's degree,

complete, *v* завершать

completion, *n* завершение

My friend has completed the studies for master's degree and would like to take postgraduate course. He would like to become the postgraduate in Applied Mathematics,

continuing professional development (**CPD)** – продолжение профессионального образования

After graduation one of the ways of the career's promotion is to take the CPD course. Continuing professional development courses gives new job competences.

Doctor of Science = **ScD** = **DSc** доктор технических наук

To become Doctor of Science one has to take the course of doctorate. After defense of doctorate thesis my brother will become the Doctor of Science.

Task 2. Read about the reasons for choosing the postgraduate course. What are your personal reasons? Motivate your choice. Discuss the problem in pairs and in groups.

Why Do We Choose Postgraduate Studies?

What does choosing the postgraduate course mean for a person? It is going up the level higher than the first degree. What are the reasons for taking postgraduate studies? The first one is the stimulus of the intellectual challenge: working with concepts, approaches, methods and ideas, developing skills of analysis and research among the researchers and academics.

The second reason is the personal challenge. What is the difference between the undergraduate and the postgraduate level? Undergraduate level develops study skills and the ability of independent studies, and the postgraduate course specifies skills perfection, responsibility, independence in one's own learning, ability to work with complex ideas and concepts and developing them.

Next, there is the serious problem of career prospects, more interesting and highly paid jobs. PhD degree or degree of Doctor of Science can be an obligatory requirement for entering the career, the researcher career or securing promotion to higher levels. In some professional fields the joint programs of universities and employers are undertaken both at undergraduate and postgraduate level and these programs are defined as the first stage of learning for the trainees.

For a number of postgraduates entering academic career as the university teacher and researcher is important. Besides, with rapid extension of higher education in some countries high-status academic position is available only with the Doctorate. It means the increase of the demand for people educated to Doctorate level.

Task 3. Read the text and answer the following questions.

a) What does your research deal with?
b) What are you engaged in at present?

Taking a Post-Graduate Course

Last year by the decision of the Scientific Council I took post-graduate courses to increase my knowledge in economics. I passed three entrance

examinations – in History, English and the special subject. So now I am a first year post-graduate student of the Belarusian State University. I'm attached to the Statistics Department. In the course of my post-graduate studies I am to pass candidate examinations in philosophy, English and the special subject. So I attend courses of English and philosophy. I'm sure the knowledge of English will help me in my research.

My research deals with economics. The theme of the dissertation (thesis) is "Computer-Aided Tools for…" I was interested in the problem when a student so by now I have collected some valuable data for my thesis. I work in close contact with my research adviser (supervisor). He graduated from the Moscow State University 15 years ago and got his doctoral degree at the age of 40. He is the youngest Doctor of Sciences at our University. He has published a great number of research papers in journals not only in this country but also abroad. He often takes part in the work of scientific conferences and symposia. When I encounter difficulties in my work I always consult my research adviser.

At present I am engaged in collecting the necessary data. I hope it will be a success and I will be through with my work on time.

Speak about yourself by answering the following questions:

a) What candidate examinations have you already passed?
b) What is the theme of your dissertation?
c) How many scientific papers have you published?
d) Are you busy with making an experiment?

Task 4. Read the text and answer the questions below.

My Research Work

I'm an economist in one of the Belarusian auditing firms. My special subject is accounting. I combine practical work with scientific research, so I'm a doctoral candidate (соискатель). I'm doing research in auditing which is now widely accepted in all fields of economy.

This branch of knowledge has been rapidly developing in the last two decades. The obtained results have already found wide application in various spheres of national economy. I'm interested in that part of auditing which includes its internal quality control. I have been working at the problem for two years. I got interested in it when a student. The theme of the dissertation is "Internal quality control of audit services". The subject of my thesis is the development of an effective internal quality control system for audit firm services.

I think this problem is very important nowadays as a major portion of public accounting practice is involved with auditing. In making decisions it is necessary for the investors, creditors and other interested parties to know whether the financial statements may be relied on. Hence there should be an internal control of auditing operations for insuring the fairness of presentation.

My work is both of theoretical and practical importance. It is based on the theory developed by my research adviser, Professor S. Petrov. He is head of the department at the Belarusian State University. I always consult him when I encounter difficulties in my research. We often discuss the collected data. These data enable me to define more precisely the theoretical model of the audit internal quality system. I have not completed the experimental part of my thesis yet, but I'm through with the theoretical part. For the moment I have 4 scientific papers published. One of them was published in the US journal.

I take part in various scientific conferences where I make reports on my subject and participate in scientific discussions and debates. I'm planning to finish writing the dissertation by the end of the next year and prove it in the Scientific Council of the Belarusian State University. I hope to get a Ph.D. in Economics.

1. What are you?
2. What is your special subject?
3. What field of knowledge are you doing research in?
4. Have you been working at the problem long?
5. Is your work of practical or theoretical importance?
6. Who do you collaborate with?
7. When do you consult your scientific adviser?
8. Have you completed the experimental part of your dissertation?
9. How many scientific papers have you published?
10. Do you take part in the work of scientific conferences?
11. Where and when are you going to get Ph.D. degree?

Task 5. Speak about your research work making use of the following exercises.

I A. Answer the questions:

1. What is your field of science/research?
2. What are the current issues in your field of science/research?
3. Have new areas of research appeared in recent years?

4. What is your particular area of research?

5. What are the latest achievements in your field of science/research?

6. Have many fundamental discoveries been made in your field of science/research?

7. Can you name some outstanding researchers in your field of science? What contribution have they made?

8. Do achievements in your branch of science/research influence everyday life? In what way?

9. What further developments can you predict in your field of science / research?

I B. Complete the sentences. Speak about your field of science/research.

1. I do research in the field of....

2. It is the science/a comparatively new branch of science that studies...

3. The field of science/research that I'm concerned with gathers knowledge about...

4. Major developments include advances in ....

5. Remarkable advances have been made in....

6. The branches of science contributing a lot to progress in my field of research are ....

7. My current field of science/research is ....

II A. Answer the questions:

1. What is your research problem?

2. What is of special interest in the problem of your research?

3. What is the subject of your research?

4. Why has the interest in this problem increased considerably in recent years?

5. Do you follow/stick to any theory/hypothesis/concept? What is it?

6. What concept is your research based on?

7. How does your research differ from other studies of the same problem?

8. Is there much literature available on your research problem?

9. Is your research problem described comprehensively/ thoroughly/ extensively in literature?

10. Is the problem only outlined or mentioned in passing?

11. What are the main aspects of the problem that have been considered?

II B. Complete the sentences. Speak about your research problem.

1. At present/now/currently I am studying the problem of...
2. The problem I am studying is concerned with ....
3. There is a lot of/little/no literature on the problem of....
4. The literature available on the problem only outlines/mentions in passing/ thoroughly/extensively/describes such aspects as ....
5. We have taken up the problem of... to ....
6. In solving our problem we follow the hypothesis that....

III A. Answer the questions:

1. Has your research problem attracted much attention in recent years? Has it been widely studied?
2. What aspects of the problem have been considered over the last few years?
3. Who was the first to recognize/point out the problem?
4. What aspects of the problem did researchers concentrate on at that time?
5. When were the first studies on the problem made? In what years?
6. What time/years do the first studies/observations/investigations date back to?
7. When was the problem first studied intensively?
8. When did the interest in this problem increase?
9. Is the problem well understood at present?
10. What aspects of the problem still remain poorly understood/unsolved?
11. Could you point out the gaps or shortcomings in the earlier studies of the problem?

III B. Complete the sentences. Speak about the historical background of your research problem.

1. In recent years ... has greatly increased.
2. Over the past few years the interest in the problem has been due to the fact that....
3. During the last 20 years interest in... has considerably ....
4. X. was the first to ... the problem of....
5. The first studies/observations/experiments ....
6. At present, research is concentrated on....
7. Many aspects of the problem still remain ....
8. It is difficult to point out... and ... of the problem.

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CONTENTS