UNIT 5

I. Learn to pronounce the following words properly:

spouting [ˊspaʊtiŋ],
varying [ˊvɛ∂ri:ŋ],
crew [kru:]
fortunately [ˊfɔ:tʃʊniti],
considerable [k∂n'sid∂r∂bli]

occur [∂ˊk∂:], exert [igˊz∂:t],
christmas [ˊkrism∂s],
agent [ˊeid (∂)nt] ,
perforating [ˊp∂:f∂reitiŋ],
bullet [bulit]

II. Translate the following sentences into Russian. Pay attention to the predicate and to different functions of "should" and "would:

1. She solution of the above mentioned problems should not be thought of without active cooperation of scientists.
2. The rise of temperature should result in some unexpected changes in the process of drilling.
3. These problems should be carefully examined before they are put into life.
4. They knew that such questions would be discussed at the conference.
5. This problem would have been realized last year provided we had had the equipment needed.
6. He was asked if he would complete his experiment in time.
7. According to the plan, he should carry out his work in May.
8. It is necessary that the derrick should be erected over the well.
9. They demanded that the new bits should be used in drilling such wells.
10. The Russian Government pays great attention to the development of heavy industry lest Russia should depend upon capitalist countries.

III. Translate the following sentences into Russian. State the functions of the participles.

1. The time required for the manufacture of such bits has greatly reduced.
2. The working day was over, they continued to study a new device.
3. No well can be drilled without the use of bits, drilling processes being very important in the oil producing industry.
4. Having been advised to use this type of a bit, they decided to use it at once.
5. When asked about the functions of a derrick, the student couldn't answer.
6. The load having been greatly increased, the bit broke.
7. The information included in these tables can help you select equipment and establish operating parameters for drilling wells.
8. (When) drilling a well, much attention should be paid to the choice of a bit.

IV. <u>Read the text and give the main idea of it:</u>

RECOVEY

When the drill bit strikes oil, the pressure of the drilling mud is usually strong enough to control any initial flow. The fountains of petroleum spouting from the well and called "gushers" are undesirable and danerous. Every effort is made to prevent them by installing heavy-control fittings directly under the derrick floor.

In oil country this installation is called a "Christmas Tree" because of its many branch-like fittings. It controls the flow of oil and natural gas from the moment the well starts producing.

But before a well can begin to produce, it must be completed. First the drill pipe and bit are removed. Cementing operations then set the final lengths of casing. Next a special instrument like a gun is lowered into the well. This perforating gun fires bullet-like charges through the casing into the producing formation to open up passages through which oil and gas can flow. Tubing then goes down inside the casing, and the oil and natural gas flow through this to the surface.

When the oil and gas reach the surface, they are separated and the gas is sent to a gas processing plant. Water and sediment are removed from the oil and the oil is then shipped to a refinery.

The life of a producing well begins with the first barrel of oil brought to the surface. It ends when the well is abandoned as uneconomical because the cost of producing the oil is greater than the price received for it.

The recovery of oil is basically a displacement process. Oil does not have the ability to expel itself from the reservoir, but must be moved from the rock formation to the well bore by a displacing agent. Fortunately, oil has two natural displacement agents that usually occur with it – gas and water.

Flush production is usually the first-stage in a well's life, though not always. This occurs when the drill taps an oil-bearing formation that has enough natural pressure to enable the petroleum to flow by itself. With variations, these types of "drives" can generate this force.

(1) Gas Cap Drive. Often there is a considerable cap of gas trapped above the oil in a formation. When the rock is penetrated, this gas expands and exerts enough pressure on the oil to move it toward the well bore leading to the surface.

(2) Dissolved Gas Drive. This is similar to a gas cap drive. In some oil accumulations the gas does not form a cap but remains dissolved in the oil. When the formation is opened, the gas expands and drives the mixture to the surface.

(3) Water Drive. In many oil reservoirs water is present beneath the oil. In formations thousands of feet deep, the gas, oil and water exist under great

pressure. When a drill opens the reservoir, the resulting release of pressure enables the underlying water to drive the oil to the well bore and, in some cases, upward to the surface. As the natural water pressure in the reservoir is reduced by oil production, water from the surrounding porous rock tends to flow into the reduced pressure zones. In the process, the water displaces the oil and drives it toward, the well bore.

V. Read and remember the following words, and word combinations:

"flush" well - фонтанирующая скважина

flush period (production) - фонтанный период жизни скважины; начальный дебит

settled production – установившийся дебит скважины

settled well – установившаяся скважина

stripper period (marginal production) - период истощения скважины; малодебитный период (режим)

gas cap drive – режим газовой шапки

dissolved gas drive – режим растворенного газа

water drive - водонапорный режим пласта

pressure release – снижение давления

to tap / to strike - вскрывать пласт

to spout – фонтанировать, выбрасывать

gusher – фонтанирование, выброс

trap - ловушка

to abandon a well – ликвидировать скважину

displacement – вытеснение

to expand – расширяться

to taper off – зд. Снижать(ся), уменьшать(ся)

production rate— дебит, нефтеотдача

to expand – тратить, расходовать

output – добыча, дебит, отдача

VI. Find the proper Russian equivalents to the following word combinations;

1. oil recovery	1. регулировать выброс нефти
2. to complete a well	2. вытеснять воду
3. to control the initial flow	3. нефтеотдача
4. a set of valves	4. перегонный завод
5. processing plant	5. заканчивать скважину
6. to reduce pressure	6. комплект задвижек
7. rate of production	7. добыча нефти
8. to displace water	8. снижать давление

VII. Translate the following sentences into English. Use the passive Voice Constructions.

1. Всем известно, что долота широко используются при бурении скважин.
2. Метод бурения скважин таким способом был разработан русскими инженерами.
3. Нам сказали, что в этом процессе используются специальные методы определения нефти.
4. При таком методе скважины бурятся на большие глубины.
5. Мы наблюдали, как устанавливают вышку на буровой.
6. Они были удивлены, что этот метод был внедрен много лет тому назад.
7. На лекции говорили о различных методах бурения скважин.
8. На процесс бурения влияют многие факторы.
9. Эти новые методы были внедрены нашими учеными.
10. В этой статье ссылаются на результаты наших опытов.
11. Природный газ хорошо транспортируется на большие расстояния.
12. Практически установлено, что нефть произошла из органического вещества.

VIII. Find English equivalents to the following word combinations:

водонапорный режим,	перерабатывающий завод,
режим газовой шапки,	газо-нефтяной фактор,
режим эксплуатации нефтяных пластов,	начальное содержание нефти,
методы вторичной добычи,	добывать нефть,
нагнетание газа в пласт,	заканчивать скважину.

IX. Translate the following sentences into English. Use the words given in the text.

1. Существуют следующие режимы эксплуатации пласта:
   а) водонапорный режим;
   б) режим растворённого газа;
   в) режим газовой шапки;
2. В некоторых пластах встречаются различные комбинации этих режимов.
3. Нефть перемещается по пласту под действием напора воды, которая вытесняет нефть из скважины.
4. Нефть может перемещаться по пласту за счёт расширения газа, который либо выделяется из нефти, либо находится в пласте в свободном состоянии.

5. Пласты, эксплуатируемые при водонапорном режиме, встречаются в осадочных отложениях песчаника, содержащих воду.
6. Вода может поступать в нефтенасыщенную зону настолько быстро, что пластовое давление будет снижаться лишь незначительно.
7. Пласты, которые эксплуатируются при режиме растворенного газа, имеют постоянный объем порового пространства.
8. Нефть проталкивается к скважине под действием газа, который выделяется из сырей нефти, по мере того, как снижается давление.
9. Часто в пласт нагнетают воду и газ для увеличения нефтеотдачи в первичном процессе.
10. Иногда воду и газ нагнетают в попытке получить дополнительное количество нефти из пласта после того, как при эксплуатации пласта на естественном режиме нефть не добывается.

X. Translate the following sentences into Russian. State the function of the Gerund.

1. I remember attending the professeo's lecture of the methods of drilling.
2. The process of extracting oil consists, of several operations.
3. They began determining the properties of the fluids.
4. He is fond of reading articles on his speciality.
5. We started asking our teacher about the functions of different bits.
6. I think of helping my friend to translate the paper about characteristics of the drilled formations.
7. We remember having been shown how the drill string was lowered into the hole.
8. After receiving new equipment they began their experiments.
9. There are different ways of discovering oil.
10. There are several ways of solving this problem.
11. This type, of bit is used for drilling in hard formations.
12. We learned about the consumption of crude oil and natural gas having increased greatly.

XI. Answer the following questions. Argue your answers:

1. What is placed to control the oil flow?
2. Why is the perforating gun used?
3. What is removed from oil when it reaches the surface?
4. When does the life of a producing well begin?
5. How does oil come to the surface from the well?
6. What are the two natural oil displacing agents?
7. What is flush production of oil?
8. What is "gas cap drive"?
9. What is "dissolved gas drive"?
10. What is "water drive"?