高等医药院校教材

（供药学专业用）

药学英语

第四册

胡廷熹　陆　波　主编

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前　言

本书是卫生部和国家医药总局组织编写的全国药学院系英语统编教材，全书分四册，主要特点如下：

1．本教材起点与高中相衔接，共有生词4000左右。第一、二册为基础部分，共40课，每课约需5学时，共200学时；第三、四册为阅读部分，共40课，每课约需4学时，共160学时，各校可根据学生外语水平及总学时数灵活使用。

2．本教材编写时，不仅注意了思想性，也力求体现科学性、实践性和趣味性，课文全部选自国外近年出版的科普文章及书籍，内容大部分带有药学倾向性，语言则力求生动、规范，富有趣味，并易于实践。

3．鉴于中学英语课程已教授过基本语法，本教材对英语语法不作系统介绍。只是对中学没学过的，或学过但不易掌握的，常见的若干语法现象作一些补充和深入的讲解和练习。

4．词汇学习（word study）部分，只就该词的各种常见用法举出例句，不作解释，以培养学生独立分析，独立解决问题的能力。

5．理解性练习（comprehension）中有些问题是课文中所没有的，教师应有意识地引导启发学生讨论研究以培养学生独立思考和用英语表达思想的能力。

6．每课后均配有补充阅读材料，内容与课文密切结合。

7．每课后均附有内容与课文相近的一段短文用作综合填空练习（cloze test）以提高学生综合理解和功能词（functional words）运用的能力。填完空白后的短文，亦可作为补充阅读材料。

8．本书全部例句及练习，除一部分结合化学、药学外，多数结合日常生活，以利于学生实践。

9．本书各册配有的练习，供学生独立完成，以达到语言实践的目的。希望各院校及有关单位或个人不要公开出售练习答案，以免影响本书的使用目的和教学质量。

10．本书各册将配录音材料，发售办法另行通知。

药学英语教材编写组

1986.12

CONTENTS

LESSON ONE

TEXT

Facts, Laws, and Theories

A scientific fact is an observation about nature that can usually be reproduced at will. For example, carbon in some forms will readily burn in the presence of air. If you have any doubt about this fact it is easy enough to set up an experiment that will readily demonstrate the fact anew. You would only need some carbon, air and a source of heat. The repeatability of a scientific fact distinguishes it from a historical fact, which obviously cannot be reproduced. Of course, some scientific facts are also historical facts–such as the movement of heavenly bodies——and are not repeatable at will.

Often a large number of related scientific facts can be summarized into broad, sweeping statements called natural laws. ① The law of gravity is a classic example of a natural law. This law, that all bodies in the universe have an attraction for all other bodies which is directly proportional to the product of their masses and inversely related to the square of their separation distance, ② summarizes in one sweeping statement an enormous number of facts. It implies that any object lifted a short distance from the surface of the earth will fall back if released. Such a natural law can only be established in our minds by inductive reasoning, that is, you conclude that the law applies to all possible cases, since it applies in all of the cases studied or observed. A well-established law allows us to predict future events. When convinced of the generality of a scientific law, we may reason deductively, based on our belief that if the law holds for all situations, it will surely hold for the events in question.

The same procedure is used in the establishment of chemical laws, as can be seen from the following example. Suppose an experimenter carried out hundreds of different chemical changes in closed, leak-proof containers, and suppose further that he weighed the containers and their contents before and after each of the chemical changes. Also, suppose that in every case he found that the container and its contents weighed exactly the same before and after the chemical change occurred. Finally, suppose that he repeated the same experi-

ments over and over again, obtaining the same results each time, until he was absolutely sure that he was dealing in reproducible facts. It can be understood then that the experimenter would reasonably conclude: "All chemical changes occur without any detectable loss or gain in weight." This is indeed a basic chemical law and serves as one of the foundations of modern scientific theory.

After a natural law has been firmly established, its explanation must be sought. Chemists are not satisfied until they have explained chemical laws logically in terms of the submicroscopic structure of matter. This is indeed a difficult process, and until recently its progress has been painfully slow because of our lack of direct access into the submicroscopic structure of matter with our physical senses. All we can do is collect③ information in the macroscopic world in which we live, and then try, by circumstantial reasoning, to visualize what the submicroscopic world must be like in order to explain our macroscopic world. Such a visualization of the submicroscopic world is called a theoretical model. If the theoretical model is successful in explaining a number of chemical laws, a major scientific theory is built around it. The atomic theory and the electron theory of chemical bonding are two such major theories.

Consider again the chemical law concerning the conservation of weight in chemical changes. What is a possible theoretical model that could explain this law? If we assume that matter is made up of atoms, and that these atoms are grouped in a particular way in a given pure substance, we can reason that a chemical change is simply the rearrangement of these atoms into new groupings, and, consequently, into new substances. If the same atoms are still there, they should have the same individual characteristic weight, and hence the law of conservation of weight is explained.

For a scientific theory to have much value,④ it must not only explain the pertinent facts and laws at hand, but it must also be able to explain new facts and laws that are obviously related. If the theory cannot consistently perform in this manner, it must be revised until it is consistent, or, if this is not possible, it must be completely discarded. You must not allow yourself to think that this process of trying to understand nature's secrets is nearing completion. The process is a continuing one.

NEW WORDS AND EXPRESSIONS

1. reproduce [ˌri:prə'dju:s] *v.* (cause to) produce a copy (of); produce the young of (oneself or one's kind)
2. at will as one wishes
3. readily ['redili] *adv.* with no difficulty; willingly
4. anew [ə'nju:] *adv.* again
5. repeatability [ripi:tə'biliti] *n.* ability to repeat
6. distinguish [di'stiŋgwiʃ] *v.* make or recognize differences
7. heavenly ['hevənli] *adj.* of, from, or like heaven; in or belonging to the sky
8. sweeping ['swi:piŋ] *adj.* influencing or extending over a great area; wide-ranging; too general
9. attraction [ə'trækʃən] *n.* power of pulling towards
10. proportional [prə'pɔ:ʃnl] *adj.* corresponding in degree or amount
11. inverse [in'və:s] *adj.* opposite (in order or position)
    ~ ly *adv.*
12. enormous [i'nɔ:məs] *adj.* very large indeed
13. inductive [in'dʌktiv] *adj.* based on induction
14. reasoning ['ri:zəniŋ] *n.* process of reaching conclusions by using one's reason
15. generality ['dʒenə'ræliti] *n.* general rule or statement; vague or indefinite remark; the quality of being general
16. deductively [di'dʌktivli] *adv.* by reasoning from a general idea or set of facts to a particular idea or facts
17. leakproof ['li:kpru:f] *adj.* treated or made so as not to let things flow in or out
18. contents ['kɔntents] *n.* that which is contained in an object
19. finally ['fainəli] *adv.* at last
20. detectable [di'tektəbl] *adj.* that can be detected
21. loss [lɔs] *n.* act or fact or process of losing; that which is lost
22. foundation [faun'deiʃən] *n.* underlying principle; basis
23. logically ['lɔdʒikəli] *adv.* according to what is reasonable or logical
24. submicroscopic [sʌbˌmaikrə'skɔpik] *adj.* too small to be seen through an optical microscope
25. access ['ækses] *n.* means of entering
26. macroscopic [mækrəu'skɔpik] *adj.* large enough to be visible to the naked eye
27. circumstantial [ˌsə:kəm'stænʃəl] *adj.* of or dependent on circum-

stances

28. visualize ['vizuəlaiz] *vt.* form a picture of (sth. or sb.) in the mind
29. successful [sək'sesfəl] *adj.* having gained an aim; having succeeded
30. bond [bɔnd] *n.* a state of being stuck together
    v. stick together
31. conservation [ˌkɔnsə'veiʃən] *n.* preservation; prevention of loss, waste, damage, etc.
32. assume [ə'sju:m] *v.* take as a fact or as true without proof
33. given ['givən] *adj.* fixed for a purpose and stated as such; specific or previously stated; assumed as a premiss
34. consequently ['kɔnsikwəntli] *adv.* as a result
35. at hand near in time or place
36. consistently [kən'sistəntli] *adv.* in agreement; regularly
37. discard [dis'kɑ:d] *vt.* get rid of as useless
38. completion [kəm'pli:ʃən] *n.* act of completing; state of being complete

NOTES

① … can be summarized into … natural laws.
能归纳成具有普遍性的一般自然法则。

② This law, that … which is directly proportional to the product of their masses and inversely related to the square of their separation distance,
句中 that 引出同位语从句，其中又带定语从句。定语从句可译为：该引力与质量的乘积成正比，与相隔距离的平方成反比，

③ All we can do is collect …
句中作表语的不定式短语之前省略了 "to"，如：
All I did was hit him on the head.
All she wanted to do was run away.

④ For a scientific theory to have much value,
这是不定式短语作目的状语，其中 For a scientific theory 为不定式的逻辑主语。

COMPREHENSION

I. Questions:

1. What is a scientific fact?
2. How could you distinguish a scientific fact from a historical fact?
3. State the law of gravity.

4. What does the chemical law of conservation of weight say?
5. Why is the logical explanation of chemical laws in terms of the submicroscopic structure of matter a difficult process?
6. How do scientists visualize what the submicroscopic world must be like?
7. How do scientists explain the law of conservation of weight?
8. How do you explain that the process of understanding nature's secrets is a continuing one?

II. True or false;

1. A scientific fact can be demonstrated anew.
2. You would only need some carbon and air to set up an experiment to demonstrate the fact that carbon in some forms will readily burn in the presence of air.
3. The law of gravity is that all bodies in the universe have an attraction for all other bodies which is indirectly proportional to the product of their masses and inversely related to the square of their separation distance.
4. A natural law like that of gravity can only be established in our minds by inductive reasoning.
5. Chemists are not satisfied with a chemical law until they have explained it logically in terms of the submicroscopic structure of matter.
6. A major scientific theory is based on a theoretical model which is successful in explaining a number of chemical laws.
7. The electron theory of chemical bonding is such a major theory.
8. There is no theoretical model to explain the law of conservation of weight.
9. A valuable scientific theory must be able to explain the pertinent facts and obviously related new facts and laws.
10. The scientific process of trying to understand nature's secrets is nearing completion.

III. Find single words in the passage which have roughly the meanings given below; the first two letters are given;

1. in a new or different way (an ···)
2. a set of ideas formulated by reasoning from known facts to explain something (th ···)
3. throw away (di ···)
4. not contradictory (co ···)
5. a factual statement of what always happens in certain

circumstances (la ···)

6. being able to discover the presence of (de ···)
7. form a mental picture (vi ···)
8. keeping from loss for future use (co ···)

Ⅳ. Fill in the blanks with appropriate words without referring to the text.

Suppose an experimenter carried out hundreds of _____ chemical changes in closed, leakproof _____, and suppose further that he _____ the containers and their contents before and after each of the chemical _____. Also, suppose that in every _____ he found that the container and its _____ weighed exactly the same before and after the chemical change occurred. Finally suppose that he _____ the same _____ over and over again, obtaining the same _____ each time, until he was absolutely sure that he was dealing in _____ facts.

WORD STUDY

relate

Ⅰ. Study the following sentences:

1. He related to us the whole story.
2. They related how they fought against this infectious disease.
3. He reviewed all the papers that related to this subject.
4. I can't relate what he does to (with) what he says.
5. Many chemical problems are related to living things.
6. Where to go and what to do when we get there are related questions.
7. We have very pleasant relations with the company.

Ⅱ. Fill in the blanks with the proper forms of the words given below:

(experience, have, for, with, relate, closely, relation)

1. We also recommended _____ reference material.
2. She related some of her _____ in U. S. A.
3. Light industry is _____ related to agriculture.
4. What is the _____ between wages and prices?
5. He had concern _____ nothing except what related to himself.
6. The young scientist related just how the accident _____ occurred.
7. We must relate these principles _____ everyday work.

will

I. Study the following sentences:

1. I will let you know as soon as we come to any conclusion.
2. Won't you sit down?
3. We would have come if it hadn't rained.
4. Would you please lend me your pen?
5. They set to work with a will.
6. Where there is a will, there is a way.
7. You may go or stay at will.
8. He left all his books to the school library in his will.
9. He took the job against his will.
10. He is willing (unwilling) to help others.

II. Fill in the blanks with the proper forms of the words given below:

(habit, at, mind, off, float, able, will, willing)

1. Oil will _____ on water.
2. Will can conquer _____.
3. He did it of his own free _____.
4. Would you _____ doing me a favour?
5. Strong will makes him _____ to overcome many difficulties.
6. With an air conditioner you can enjoy comfortable temperatures _____ will.
7. Won't you take _____ your coat?
8. Is she _____ to take care of the children while you are away?

doubt

I. Study the following sentences:

1. I doubt the truth of this report.
2. Nobody can possibly doubt what he says.
3. I doubt if I can finish it before 6 o'clock.
4. There is no doubt at all about it.
5. His doubts and fears are gone.
6. It is beyond (all) doubt one of the excellent books.
7. No doubt (without doubt) it is very absurd.
8. When in doubt about the meaning of a word, consult a dictionary.

II. Fill in the blanks with the proper forms of the words given below:

(word, true, from, honest, beyond, in, doubt, about)

1. I don't doubt that you are _____.
2. He says he can cure me, but I still have my doubts _____ it.

3. There is no _____ that he is a fine scholar.
4. No doubt (without doubt) I learned a lot _____ that lecture.
5. I was _____ doubt about it.
6. You can write to him if you doubt my _____.
7. I doubt whether it is _____.
8. The truth of the story is _____ doubt.

until (till)

Ⅰ. study the following sentences:

1. We won't start until the teacher comes.
2. I am afraid I cannot finish the work until Friday.
3. He was true to the cause of science till death.
4. He will be on holiday from July till September.
5. I hope to stay here till (until) Sunday evening.
6. Wait until I call you up.
7. Not until yesterday did I know anything about his disease.
8. It was not until last night that the post-graduate completed his paper.

Ⅱ. Fill in the blanks with the proper forms of the words given below:

(nothing, from, next, until, fully, read, do, not)

1. Don't leave the laboratory until instructed to _____ so.
2. Not until he _____ the letter did he know how seriously ill his father was.
3. She did _____ arrive until 10 o'clock.
4. The young pharmacist works hard _____ morning till night.
5. The patient becomes almost normal till _____ attack.
6. I could do _____ until he arrived.
7. The patient must be kept in bed_____ the fever comes down.
8. It was not until yesterday that the patient was _____ recovered.

Ⅲ. Translate the following into English:

1. 你可以任意改变将要加入的溶剂量。
2. 碳与生命和能量有密切的关系。
3. 无疑地她是我们班里最好的学生。
4. 科学定律概括了大量的有关事实。
5. 无人怀疑这个理论的真实性。
6. 直到本世纪的40年代，这一自然定律才被确认。

SUPPLEMENTARY READING

The Nature of a Hypothesis

When our means of observation of any natural fact fail to carry us beyond a certain point, it is perfectly legitimate, and often extremely useful, to make a supposition as to what we should see, if we could carry direct observation a step further. A supposition of this kind is called a hypothesis, and the value of any hypothesis depends upon the extent to which reasoning upon the assumption that it is true enables us to account for the phenomena with which it is concerned.

Thus, if a person is standing close behind you. and you suddenly feel a blow on your back, you have no direct evidence of the cause of the blow; and if you two were alone, you could not possibly obtain any; but you immediately suppose that this person has struck you. Now that is a hypothesis, and it is a legitimate hypothesis, first, because it explains the fact; and, secondly, because no other explanation is probable, "probable" meaning in accordance with the ordinary course of nature. If your companion declared that you fancied you felt the blow, or that some invisible spirit struck you, you would probably decline to accept his explanation of the fact. You would say that both the hypotheses by which he professed to explain the phenomenon were extremely improbable; or in other words, that in the ordinary course of nature fancies of this kind do not occur, nor spirits strike blows. In fact, his hypotheses would be illegitimate, and yours would be legitimate; and, in all probability, you would act upon your own. In daily life nine-tenths of our actions are based upon suppositions or hypotheses, and our success or failure in practical affairs depends upon the legitimacy of these hypotheses. You believe a man on the hypothesis that he is always truthful; you give him pecuniary credit on the hypothesis that he is solvent.

Thus, everybody invents, and, indeed, is compelled to invent, hypotheses in order to account for phenomena of the cause of which he has no direct evidence; and they are just as legitimate and necessary in science as in common life. Only the scientific reasoner must be careful to remember that which is sometimes forgotten in daily life, that a hypothesis must be regarded as a

means and not as an end; that we may cherish it so long as it helps us to explain the order of nature; and that we are bound to throw it away without hesitation as soon as it is shown to be inconsistent with any part of that order.

CLOZE TEST

Fill in the blanks with the following words:

(skill, science, drawn, previously, law, recently, as, up, down, to, results, fields, stages, parts, regarding, needs, facts, under, on, in)

Chemistry and all other sciences are based _____ experimentally established facts. When a number of facts have been collected and classified, conclusions may be _____ as to the probable behaviour of systems _____ conditions that have not yet been investigated.

When a number of phenomena have been observed and studied with exact measurements, often a_____ can be developed that will predict the behaviour of similar systems under different conditions. This law is not an expression of absolute truth; it is a condensed statement of _____ that have been discovered by experiment.

Natural laws may be discovered either by the correlation of experimentally determined facts or by speculation _____ to the probable cause of the phenomenon that is being investigated, Such a speculation _____ the cause of a phenomenon is called a hypothesis. After a hypothesis has been subjected to the test of experiment and after it has been shown that it applies _____ a large number of phenomena, it is called a theory.

Usually science progresses through four _____: first, observation and measurement; second, inductive conclusions from the _____; third, deductive conclusions based on hypotheses and theories and fourth, experimental testing to prove or disprove the theoretical deductions.

Many hypotheses will have to be given _____ when new facts and more precise data are obtained, but they fulfil a very necessary function in the development of science. They stimulate further research and open up new _____ or explain and coordinate facts that were _____ unrelated. The scientist _____ imagination in creating new hypotheses, but he also needs _____ in his experiments to test them, and critical judgement in evaluating the results.