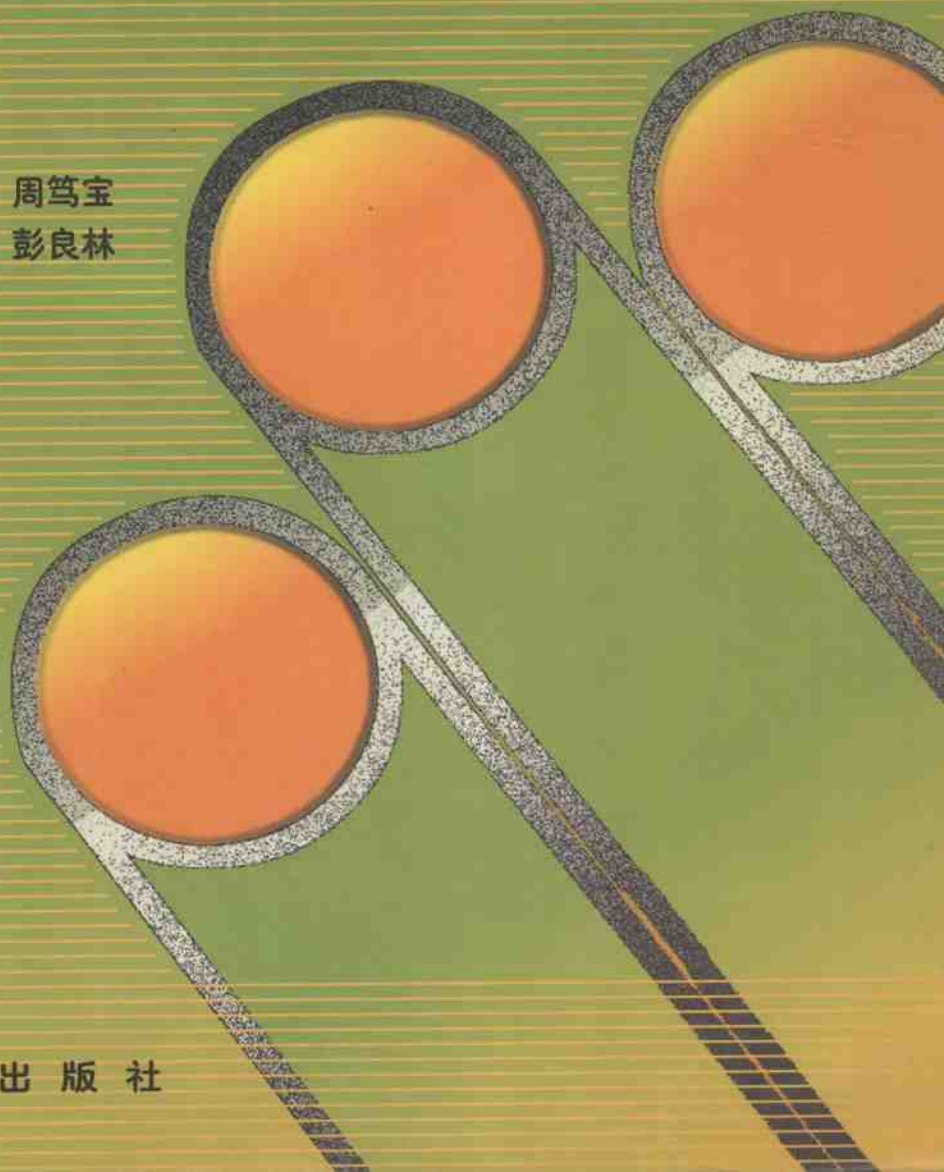
医学英语阅读与翻译教程

Medical English Course—Reading and Translation

主　编　贾德江　周笃宝
副主编　刘明东　彭良林



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前　言

国家教育部新颁布的全国《大学英语教学大纲》（修订本）明确指出："本科学生在完成基础阶段的学习任务，达到四级或六级后，都必须修读专业英语，以便从基础学习阶段过渡到应用阶段。"根据《大纲》的要求，我国绝大多数普通高等医学本科院校均开设了医学英语阅读课程。但是，近几年来，我们发现有大约50%的本科医学生在基础英语学习阶段结束时仍未能通过英语四级考试，因此在上医学英语课时往往一心挂两头；加上现行国内出版的医学英语阅读教材均在书后面附有答案和译文，使得教师在上课时感到无所适从。如何使50%左右的本科生在学习医学英语的同时，又能复习巩固所学的语言知识，再次备考英语四级？如何使大多数医学生能在毕业时看懂英语医学刊物，撰写医学论文的英文摘要，从事中等难度的医学英语汉译？针对这一难题，我们组织编写了这本《医学英语阅读与翻译教程》，旨在帮助医学本科生顺利地从基础英语学习阶段过渡到英语应用阶段。

本书内容共分为三大部分：第一部分（Part Ⅰ），由20个单元组成，每个单元均包括四项内容：医学专业阅读课文（Text）1篇（篇幅较长）；普科医学阅读理解测试短文2篇（Passage A，B），按四级要求设计5个理解题；科普医学英译汉练习短文1篇（English-Chinese Translation Practice）；汉译英练习句子5个（Chinese-English Translation Practice）。第二部分（Part Ⅱ）由涉及临床医学专业知识的16篇英语短文组成（中等篇幅），供学生课后作翻译练习使用。第三部分（Part Ⅲ）由三个附录内容构成：附录Ⅰ，第二部分（Part Ⅱ）的全部汉语参考译文；附录Ⅱ，比较全面的医学术语构词法；附录Ⅲ，药物说明书，医疗器械广告，医学论文和摘要的英文写作，医学英语汉译技巧和医学英语长难句分析。

本书的选材不仅涉及传统医学领域，如生殖器官、胚胎细胞、人体系统功能和常见的疾病及其诊断和治疗，而且涉及现代医学的新兴领域，如营养学、免疫学、精神病学、生物遗传工程和现代医学检测手段等。此外，本书还选用了传统中医诊断和针灸的内容。

本书具有较强的针对性和实用性。为了教与学的方便，提高教学效果，本书第一部分的课文和阅读理解短文、英译汉练习短文和汉译英练习句子，均未将其参考译文和答案附在书后，而是掌握在教师手中。这样十分有利于提高学生学习的积极性，提高他们的阅读理解、写作和翻译能力。本书适用于80～100学时的教学任务。

本书由贾德江、周笃宝两位教授任主编，刘明东、彭良林两位副教授任副主编，贾德江教授负责了全书的策划和终审。虽然编者竭尽全力想给读者提供最佳产品，但因时间仓促，且水平有限，书中错误遗漏之处在所难免，恳请读者使用时不吝赐教。

编者

2001年8月

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Unit I

Text: Regulation of Metabolism

Preamble

The survival of a cell or organism depends upon its ability to alter metabolic flux in response to changing conditions, although the result may be a maintenance of the status quo (called homeostasis in whole animals). Examples are: the switch from glucose to fatty acid metabolism in the starving mammalian liver; the induction of enzymes to metabolize lactose in *E. coli* when that sugar is included in the medium; and the inhibition of cholesterol synthesis in fibroblasts when they are presented with cholesterol in low density lipoproteins. Chapters in books and examination questions often approach the phenomena of regulation in general terms, and are adorned with words such as "regulation", "control", "modulation", and so on. The precise definition of these words and their implications for teleology need not concern us at this level since we are again aiming at simplification for ease of regurgitation. As ever, the approach is to identify the essentials of the topic (in this case, regulatory factors) to try to classify them and to discuss them briefly. Then, it is hoped, we sum up overall with a clear memorizable diagram. But two preliminary points can be made.

(1) It is at present difficult to classify regulatory factors, since primary effects cannot always be distinguished from secondary ones. Thus cAMP and glucagon both cause lipid breakdown in liver, but glucagon's role is as an effector for cAMP synthesis. In this case the relationship is known; there are many other cases where the hierarchy of effectors remains obscure.

(2) It is the catalytic of enzymes which is the basis of metabolism, so that regulation of metabolism ought to be explicable, ultimately, in terms of rates of transformation due to enzyme catalysis.

Following up the latter point, the rate of flow of atoms through an enzyme-catalysed reaction is dependent upon: ① the amount of substrate or product present; ② the amount of

enzyme available; ③ the catalytic efficiency of the enzyme.

All dietary, hypothalamic, endocrine, and nervous controls should be reducible, perhaps through many levels of effector, to ①, ②, and ③, either singly or in combination. We set down what we know about each.

Regulation of the Rates of Enzymic Reactions

Availability of Substrate and Product

In the glucokinase reaction in the liver, glucose + ATP ⟶ glucose 6-phosphate + ADP. The nature of the enzyme is such (high K_m for glucose) that at low glucose concentrations the reaction cannot proceed. Thus glycolysis is slowed down because there is just not enough glucose available. Although this is a coarse (insensitive) control, it is fast because in itself it involves no synthesis or transport mechanisms.

If a substrate is confined by a membrane then it is not accessible to catalytic activity by an enzyme on the other side of the membrane. Thus, acetyl CoA cannot cross the mitochondrial membrane so that when it is genetated in the mitochondria it leak out to be converted to fat by the actin of acetyl CoA carboxylase. When energy is required, presumably the primary consideration, it is oxidized within the mitochondria. Only where ATP is plentiful is it transported outside as citrate; limitation of the rate of lipogenesis, then, is due to compartmentation of acetyl CoA.

Enzyme Availability

When an enzyme is synthesized in response to chemical stimulus the phenomenon is known as induction. When normally-proceeding enzyme synthesis is slowed, there is repression. Induction is normally associated with control of catabolism, repression with control of anabolism. An example of induction is the synthesis of penicillinase by penicillum notatum in response to appearance of penicillin in growth medium. An example of repression is when Salmonella typhimurium, synthesizing leucine because it is lacking in the growth medium, ceases to synthesize appropriate enzymes when sufficient leucine has accumulated. Inducible enzymes in mammalian tissues include lactase (synthesized by adult intestine in response to a milk diet) and liver arginase (synthesized in response to a high protein diet; it is necessary for urea production). Other terms used in this context are as follows:

Constitutive enzyme: an enzyme present in a cell in fairly constant amounts, that is non-inducible.

Coordinate induction: a single inducer may bring about synthesis of a number of inducible enzymes. The inducer is normally the first substrate in the pathway. Complementary to this is coordinate repression.

Derepression is the cancelling of repression, so that an induction is apparently observed — a negative cancelling a negative appears as a "positive".

Induction and repression are thought to be the result of modification of gene expression. The smallest unit of genetic expression is the cistron, a structural gene coding for the synthesis of an enzyme subunit. The cistrons are functionally combined in a unit called the operon, which may be described as a regulated gene cluster.

There is no escaping from the lac operon in this context, observation of which first suggested the concept. Escherichia coli grown on a lactose-free medium has very low activities of lactase(β-galactosidase), but the enzyme appears (is induced) on introduction of lactose. Not only that, but a protein termed a permease is detectable. The permease is a carrier to effect penetration of the inducer lactose into the cells. Genetic mapping techniques indicated that the operon or gene cluster for this coordinated protein synthesis consists of: (a) structural genes for the permease and lactase proteins; (b) an operator gene; (c) a regulator gene. The regulator gene transcribes RNA for repressor at a constant rate, so the repressor is constitutive. The repressor binds with high affinity to the operator gene, which prevents the initiation of transcription at the structural genes. When allolactose(the physiological inducer, with glucose and galactose 1,6 linked rather than 1,4 as in lactose) is present, it binds to the repressor, detaching it from the operator gene. This allows initiation of transcription on the structural genes. Lactase permease then allows utilization of lactose in the medium.

In eukaryotes, genes coding for metabolically-related sequences of enzymes are not in general closely linked to form an operon. Protein synthesis is often associated with endocrine stimulation instead of the direct presence of the metabolizable inducer. Hormones which alter the rate of protein synthesis include insulin, thyroxine, somatrophin, testosterone, and cortisol.

Alteration of Catalytic Efficiency

(1) By allosteric modification: the allosteric effector modulates activity by binding to a site other than the catalytic site. It can thus increase or decrease activity through some conformational change induced in the enzyme. The phenomenon is described by the sigmoid reaction rate — substrate concentration curve, the implications of which are critical. Small concentrations of an effector are without significant influence. At intermediate concentrations a small change in effector concentration produces a proportionately large effect upon the enzyme. There is then a saturation region. The control effect resides in the large change produced by a small build-up of effector. An example is the allosteric inhibition of phosphofructokinase by ATP and citrate.

(2) By covalent modification: some enzymes such as glycogen synthetase, phosphorylase, pyruvate dehydrogenase, and hormone-sensitive lipase possess one or more seryl or tyrosyl residues which can be phosphorylated at the expense of ATP. The phosphorylated form has a different catalytic activity from the dephosphorylated form. The phosphorylated form is reconvertible to the dephosphorylated form by the action of a phosphatase.

New Words

metabolism[me'tæbəlizəm] *n.* 代谢
flux[flʌks] *n.* 流向，流动
homeostasis[həumiəu'steisis] *n.* 内环境稳定，体内平衡
glucose['glu:kəus] *n.* 葡萄糖
mammalian[mæ'meiljən] *a.* 哺乳动物的
enzyme['enzaim] *n.* 酶
lactose[læktəus] *n.* 乳糖
E. coli 大肠杆菌
cholesterol[kəu'lestərɔl] *n.* 胆固醇

fibroblast['faibrəblɑ:st] *n.* 成纤维细胞
lipoprotein[lipəu'prəuti:n] *n.* 脂蛋白
modulation[mɔdju'leiʃən] *n.* 调整，调节
teleology[teli'ɔlәʒi] *n.* 目的论
regurgitation[rigə:dʒi'teiʃən] *n.* 回流
diagram['daiəgræm] *n.* 图表，线图
glucagon['glu:kəgɔn] *n.* 胰高血糖素
hierarchy['haiə'rɑ:ki] *n.* 等级
catalytic[kætə'litik] *n.* 催化的
substrate['sʌbstreit] *n.* 底物
hypothalamic[haipəθə'læmik] *a.* 下丘脑的
endocrine['endəukrain] *n.* 内分泌
glucokinase[glu:kəu'kaineis] *n.* 葡萄糖激酶
acetyl['æsitil] *n.* 乙酰
mitochondria[maitə'kɔndriə] 线粒体
carboxylase[kɑ:'bɔksi'leis] *n.* 羧化酶
citrate['sitreit] *n.* 柠檬酸，枸杞酸
lipogenesis[lipəu'dʒenisis] *n.* 脂肪生成
compartmentation[kəmpɑ:tmen'teiʃən] *n.* 区域化
repression[ri'preʃən] *n.* 阻遏，抑制
penicillinase[peni'silineis] *n.* 青霉素酶
penicillium notatum *n.* 特异青霉菌
salmonella[sælmə'nelə] *n.* 沙门菌
typhimurium[taifi'mjuəriəm] *n.* 鼠伤寒
leucine['lju:sin] *n.* 亮胺酸
arginase['ɑ:dʒineis] *n.* 精胺酸酶
urea['juəriə] *n.* 尿素，脲
cistron['sistrən] *n.* 顺反子，作用子
subunit['sʌbjunit] *n.* 亚基
operon['ɔpərən] *n.* 操纵子
permease[pə:mi'eis] *n.* 渗透酶
affinity[ə'finəti] *n.* 亲和力
allolactose[æləu'læktəus] *n.* 异乳糖
galactose[gə'læktəus] *n.* 半乳糖
eukaryote[ju:'kæriəut] *n.* 真核生物
hormone['hɔ:məun] *n.* 激素，荷尔蒙
insulin['insjulin] *n.* 胰岛素
thyroxine[θai'rɔksin] *n.* 甲状腺素
somatrophin[səu'mætrəpin] *n.* 生长激素
testosterone[te'stɔstərəun] 睾丸酮
cortisol['kɔ:tisɔl] *n.* 皮质醇
allosteric[æləu'sterik] *a.* 变构的
conformational[kɔnfɔ:'meiʃənəl] *a.* 构造的
sigmoid['sigmɔid] *a.* S形的
saturation[sætʃə'reiʃən] *n.* 饱和
phosphofructokinase['fɔsfəfrʌktə'kaineis] *n.* 磷酸果糖激酶
covalent[kəu'veilənt] *a.* 共价的
pyruvate['paiəruveit] *n.* 丙酮酸
dehydrogenase[di'haidrədʒəneis] *n.* 脱氢酶
lipase[laipeis/lipeis] *n.* 脂肪酶
seryl['siəril] *n.* 丝氨酰
tyrosyl['taiərəsil] *n.* 酪胺酸
residue['rezidju:] *n.* 残基

Reading Comprehension Quiz

Passage A

Science has moved closer toward identifying the long-sought brain site of the body clock that governs all the rhythms of life.

A Johns Hopkins University scientist has discovered that a group of rats has been transformed by precision brain surgery from performing night activity to day activity in a complete reversal of their age-old timetable.

Dr. Curt P. Richter has developed a surgical means of destroying the animal's built-in clock in a special portion of the brain so that it spends most of the light hours being active and all of the dark hours sleeping. "We now know much more about the location of the clock," said Richter in an interview.

Richter said the findings support the view that body clocks have independent function and do not need to rely on the sun, gravity or earth magnetism.

The body clock, in Richter's opinion, is like a precision self winding calendar wristwatch with a built-in timer. In Richter's study, the rhythm of the rats' activity previously had not been disturbed by the arrival of laboratory workers at day and departure at night, but when deprived of their body clocks, the animals adopted a new timetable that was controlled by the working hours of the laboratory.

Like animals, man has evolved a 24-hour clock. Richter believes human beings started out sleeping about 12 hours during night. Introduction of the campfire, he says, enabled man to extend his waking hours so that he sleeps a third of the time. This is true everywhere, even above the Arctic Circle, where summer brings constant daylight.

Over the years, scientists have found that no fewer than 40 physiological functions of the body have rhythms that are timed by the biological clock. Temperature, for example, is regulated so that it is at least two degrees higher in the late afternoon than the low point in the early morning hours.

Peak efficiency is reached at certain periods of the day. Time zone effects of air travel cause jet lag. Similarly, there are daily rhythms in blood-pressure levels, blood-sugar level, pulse rate and even stomach contraction. The effectiveness of drugs given to a patient varies depending on what hours of the day or night they are given. It is likely there are best and worst times to perform surgery, take X-rays and diagnose disease, but these have tended to be masked in the process of evolution.

1. According to the passage, body clocks _____.

A) govern all the rhythms of life

B) rely on the sun, gravity or earth magnetism

C) have independent function

D) both A and C

2. Temperature is timed by _____.

A) physiological functions C) timer

B) biological clock D) wristwatch

3. As used in the third paragraph, "built-in clock" refers to _____.

A) rhythm C) cycle

B) built-in timer D) body clock

4. For whom is the author probably writing this passage?

A) Teachers and college students C) Scientists

B) Readers of popular science D) Biologists

5. According to the passage, which of the following statements is true?

A) Richter succeeded in destroying the rats' body clock

B) Richter failed to destroy the rats' body clock

C) The lowest temperature of a person may occur in the late afternoon

D) we may perform surgery and take X-rays efficiently at the same time of the day

Passage B

It has been argued that an infant under three who is cared for outside the home may suffer because of the separation from his parents. The British psychoanalyst John Bowlby maintains that separation from the parents during the sensitive 'attachment' period from birth to three may scar a child's personality and predispose to emotional problems in later life. Some people have drawn the conclusion from Bowlby's work that children should not be subjected to day care before the age of three because of the parental separation it entails, and many people do believe this. But there are also arguments against such a strong conclusion.

Firstly, anthropologists point out that the secluded love affair between children and parents found in modern society does not usually exist in traditional societies. For example, we saw earlier that among the Ngoni the father and mother of a child did not rear their infant alone — far from it. But traditional societies are so different from modern societies that comparisons based on just one factor are hard to interpret.

Secondly, common sense tells us that day care would not be so widespread today if parents, caretakers or pediatricians found that children had problems with it. But Bowlby's analysis raises the possibility that early day care has delayed effects. The possibility that such care might lead to, say, more mental illness or crime 15 or 20 years later can only be explored by the use of statistics. Statistical studies of this kind have not yet been carried out, and even if they were, the results would be certain to be complicated and controversial.

Thirdly, in the last decade, there have been a number of careful American studies of children in day care, and they have uniformly reported that day care had a neutral or slightly positive effect on children's development. But tests that have had to be used to measure this development are not widely enough accepted to settle the issue.

But whatever the long-term effects, parents sometimes find the immediate effects difficult to deal with. Children under three are likely to protest at leaving their parents and show unhappiness. At the age of three or three and a half almost all children find the transition to nursery easy, and this is undoubtedly why more and more parents make use of child care at this time. The matter, then, is far from clear-cut, though experience and available evidence indicate that early care is reasonable for infants.

6. Which of the following chapters is the passage most likely to be found in?

A) Going to School
C) Problems of Development
B) The Challenges of Growth
D) Parents and Children

7. According to Bowlby, separation from parents may _____.

A) have immediate effects on an infant
B) make an infant sensitive to attachment
C) help build up an infant's personality
D) damage an infant's personality

8. What does the word "predispose" in Paragraph 1 most probably mean?

A) oppose
C) incline
B) expose
D) trend

9. What can be inferred from Paragraph 3?

A) There is no negative long-term effect on infants who are sent to school before the age

of three.

B) Nursery school is widespread nowadays.

C) Infants under three should not be sent to nursery school.

D) Nursery school has a neutral or slightly positive effect on children's development.

10. What is the author's conclusion?

A) Early care is reasonable for infants.

B) It is not obvious whether day care is good for infants under the age of three.

C) Early care is not reasonable for infants.

D) Day care is far from satisfactory.

English-Chinese Translation Practice:

Get a Thyroid Test

By Christine Gorman

That's the new advice, from a respected group of doctors, for women 50 and older. Here's why.

If you're like most people, you've never given your thyroid a second thought. Shaped like a bow tie and wrapped around the windpipe at the base of the throat, the thyroid helps regulate your body's metabolism much as a thermostat controls the temperature in your house. But if you're female and 50 or older — or love someone who is — you need to consider whether the old thermostat is still working. Last week the American College of Physicians, a conservative arbiter of treatment standards, recommended a blood test for thyroid disorders at least once every five years for all women in this age group.

The advice comes as something of a reversal for the A. C. P. Back in 1990, it argued that routine screening was unnecessary because doctors could pick up most thyroid disorders on their own. Since then, however, studies have shown that among women who are middle-aged and older, 1 in 71 suffers from a thyroid disorder that is severe enough to cause problems but has never been diagnosed. (Men also develop thyroid disease as they age, but at a much lower rate.) Why do doctors miss so many cases? Turns out that many symptoms associated with thyroid disorders mimic the signs of aging.

Which disorders and what symptoms? Generally the thyroid causes problems in two different ways. The more common disorder, hypothyroidism, occurs when the gland fails to produce enough thyroid hormone. The body's metabolism slows down, and the patient complains of not having any energy and feeling mentally sluggish.

By contrast, if the thyroid works too hard, a condition called hyperthyroidism, it can rev your body up to the point that your hands tremble. You have trouble falling asleep, and your heart quivers in a dangerous pattern called atria fibrillation. In an extreme case, your eyes will bulge.

Fortunately, there is a fairly simple blood test, called a TSH test, that helps doctors determine whether you have a thyroid disorder. The cost ranges from $30 to $50, but the test can be conducted as part of a regular battery of blood work for cholesterol and other

substances.

If you have hypothyroidism, a drug called thyroxine can boost your hormone levels. Dr. Mark Helfand, an internist at the Veterans Medical Center in Portland, Ore, and a co-author of the new guide-lines, says those who take the drug will "need it the rest of their life, and should be monitored every six months or so to make sure they don't get too much."

If you have hyperthyroidism, drugs can slow down the thyroid or, if need be, radioactive iodine can destroy it completely — at which point you will have to take thyroxine.

As helpful as the new guidelines will be for detecting clear-cut cases of thyroid disease, there is one controversy women should be aware of. Screening will pick up lots of borderline cases. As many as 10% of older women may have slightly abnormal blood tests but appear to be otherwise healthy. Sometimes their hormone levels will return to normal after a few months. So far, there hasn't been a research study large enough to determine whether they should be taking drugs as well. Until there is, most doctors will be understandably reluctant to treat a woman whose only symptom is an oddball number on a blood test.

Chinese-English Translation Practice:

1. 新陈代谢是人体内进行的一切化学变化的总和。
2. 动植物组织通过奇妙的合成代谢转换成人体组织。
3. 基础(basal)代谢指的是人体在休息状态下所发生的化学反应。
4. 代谢率随性别、年龄、气候不同而异。
5. 我们的身体是由叫做细胞的微小块状物构成的。