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机械制造和冶金专业

英语教科书

[苏联] M. A. 巴拉本編

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英語教科書

[苏联] M. A. 巴拉本 編

游經世 譯

商务印书馆

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內 容 提 要

本書目的在於培養讀英閱讀和翻譯英語原文科技書籍的能力。

本書備有課文、閱讀材料、語法參考、詞匯表以及讀音、語法和翻譯等練習。

我國高等學校學生學習第二外國語前多已學過俄語，故譯文盡量結合俄語語法用語。

原書是為蘇聯學生所編寫，因不盡適合我國學生處，不得不稍作增減和更動。

本書可用作機械製造和冶金專業的教材。

機 械 製 造 和 冶 金 專 業

英 語 教 科 書

[蘇聯] М. А. 巴拉本編 游紀日譯

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前 言

本教材专供技术学校学生和下列各专业自學英語的工程技術人員之用：

1. 煉鐵。
2. 煉鋼。
3. 有色金屬冶煉。
4. 金相學。
5. 金屬熱加工。
6. 鑄造生產。
7. 金屬壓力加工。
8. 焊接生產。
9. 金屬切削加工。

在中等專門學校，本書可以用作：

- 1) 十年制中學以上的班級的教材，或
- 2) 三年級（60 學時）的專業讀本，假若前兩年的英語教學是用其他教科書的話（指蘇聯七年制中學生升入中等專門學校的情況——譯注）。

使用本教材的學生應具有中學第七年級教學大綱所規定的知識，即應具有初步閱讀能力，熟悉基本語法形式，並掌握最低限度的詞匯量——約 500 個最常用的單詞和詞組。

為了便於學生復習和鞏固以往所學材料起見，書末特附有學生學習本教材前所應熟悉的詞匯表。本書在闡述新語法現象的同時，也結合復習舊材料。詞匯表中的單詞均注有國際音標。前八課並配有復習性的讀音練習。此外，書末尚有語法參考表三種：常用前綴和後綴表，不規則動詞表和時態表。

本教材的主要目的在于訓練学生掌握英美原文专业書刊，教材內的課文、詞汇和語法材料，是供学生在技术学校整个学习期間之用。

本教材包括下列各内容：

1. 二十課正課，每課均有課文和練習。
2. 三課複習課（第10、17、25課），每課均有課文和複習練習，複習課的課文是根據熟練工人口述和語法材料來編寫的。
3. 附录——有关冶金和金屬加工各問題的文选。
4. 各課語法注解。
5. 語法表解——常用前綴和后綴表，不規則動詞表，因态表。
6. 学生学习本教材前所应熟習的詞汇表。
7. 包括本書所有詞汇的索引表。

教材的第一部分（1—10課）是總論性質，課文主题包括金屬工艺学的所有部門，自鍛爐主产起至金屬机械加工止，編写課文是以一年級学生易于了解的方式来詢問冶金和金屬加工的各主要过程，本書在技术学校一年級便开始使用（学生稍后才开始学金屬工艺学），所以这样做完全是必要的。

第二部分（11—17課）課文专講金屬的物理性质，金屬的物理性质測定法，以及冶金方法的物理基础。

第三部分（18—25課）課文专講金屬的切削和切削加工的过程。

各課均有課文和巩固学习的练习，每一課文都有35—45个生詞，通常只介绍一种新的語法結合，这些生詞和結合是可能通过有連貫性的課文来巩固。根据課文所提出的語法結合，旨在促使学生注意某种語文形式，使其能瞭解这种形式的一切和意义，并能譯成祖国语文。

所有正課和複習課的語法結合是进一步学习的主要形式。

此外，多数課还根据課文配有“答問”練習，前十七課并有檢查性的翻譯練習。

复习課的課文和練習完全是用学生所熟悉的詞汇和語法來編写的（偶有不熟悉的單詞或詞組，則加括弧），学生可能在較短期間內研究大量課文，不感困难。复习課的練習一般都是純詞汇性的——构詞法和艰難的詞組等。

若干單詞在英美科技書刊中各有不同的拼写法，例如：英国 centre，美国 center；英国 mould，美国 mold。本書課文通常采用美国拼写法，但在書后詞汇表中，則英国拼写法亦一併列出，以美国拼写法为主是因为学生将来所須接觸的科技書刊中美国的較多，英国的較少。

有些術語通常仅用專門符号（°——degree，%—per cent）或簡写（F.—Fahrenheit，lb.—pound）。为了培养学生正确朗讀術語的習慣起見，本書前十課用它們的完整原文，自第十一課起則仍沿用習慣標誌。

研究英語語法，本身并非目的，只是帮助正确了解語句結構的手段，所以本書只是对于在結構或意义上和俄語有所不同的那些語法形式詳加分析。闡述英語語法是用和俄語对比的方式来进行。由于本書亦供不熟悉俄語語法理論的人員使用，故在可能的場合，尽先援引实用俄語來对比。

書末詞汇表不仅可用作閱讀課文的參考，而且学生还应借以掌握外語詞汇，学会使用专业的和普通的辞典。所以，詞汇表內的詞汇不仅注有本書所出現的意义，同时也还注有其他意义。此外，詞汇表中一般仅有基本單詞，派生單詞多未列入。派生單詞的意义，学生应利用書后的常用前綴和后綴表來确定。自然，并非所有派生單詞都是如此，有些派生單詞的意义是不可能直接由詞根來确定的。例如，詞汇表中有形容詞 hard（硬的），但无名

詞 hardness (硬度), 因为它的意义是很容易从詞根看出来的。但是动词 harden 却又列入詞汇表中, 因为它除有可从詞根看出“使硬”, “变硬”的意义外, 还有“淬火”的意义。其他由这动词派生出来的 hardening (淬火), hardenable (可淬火的) 和 hardenability (淬透性) 則又因上述关系而未列入詞汇表中。

对于本教材的意见和希望請寄基輔市巴黎公社大街十一号机械制造业書籍出版社乌克兰分社。

學生須知

認識外語單詞就是根據上下文來理解單詞的涵義，不能用本國語言來硬套外文單詞的涵義，只有通過鑽研課文的詞匯和習作有關練習才能真正掌握必要的外語詞匯量。

學習語法就是指理解課文內各種語法結構的意義，不要死啃語法規則，了解語法規則只是為了要在閱讀課文時能理解有關的語言形式的意義。

譯成祖國語言就是把通過外語理解的意思想，用祖國語言敘述出來，只有徹底理解，才能真正翻譯，翻譯出來的句子不應只是用本國語言單詞來代替外語單詞，這樣是會造成很大錯誤的，利用辭典查閱生詞的意義時，要反復推敲整個句子的意思，直到徹底明白了為止，只有這樣才能著手翻譯。

I. 自習課文程序

1. 閱讀課文前，先研究語法參考的有关章節，並分析課文中帶黑體字的句子。

2. 瀏覽整個課文及其插图，以便了解課文的中心內容。

3. 進而研究单个句子時，先把它朗讀一遍，注意生詞和疑難詞匯的讀法。

4. 揣摩整個句子的意思。

5. 划出句中所有生詞，從整個句子范疇的結構和詞與詞的關係等去分析它們的語法范疇（詞類和成分）。

6. 從詞匯表中去找生詞的意義，並檢查其讀法。

7. 從整個句子的意思和具体單詞的語法作用去選擇最恰當的意義。

8. 詞匯表中若查不到派生單詞的意義，則可利用書后常用前綴和后綴表來確定它的意義。

9. 重新閱讀整个句子，以便正确理解它的涵义。
10. 若句子結構复杂，則必須詳加分析，先找主語和謂語，并翻譯它們，然后再去研究次要成分及其他。
11. 將整个句子譯成本國語文。
12. 如此逐句鑽研整本課文。
13. 最后，反復閱讀課文2—3遍，每次都翻譯一下。

II. 有关練習和复习課注意事項

1. 做練習和閱讀复习課都要先整个閱讀一遍，以正確理解內容。
2. 要明确习题的語法形式，然后再按語法要求去做它。
3. 翻譯所有練習中和复习課中的課文。
4. 聲音練習，構詞法練習，和閱讀練習均用口頭進行，課文翻譯練習毋須書面進行。其他如答問，譯成英語，同義詞和反義詞等練習則用書面進行。

LESSON 1

Degrees of Comparison § 9

(Passive Voice) § 12

Metals and Their Use

It is known that metals are very important in our life. Metals have the greatest importance for industry. All machines and other engineering constructions have metal parts, some of them consist only of metal parts.

There are two large groups of metals:

- 1) Simple metals — more or less pure chemical elements.
- 2) Alloys — materials consisting of a simple metal combined with some other elements.

About two thirds of all elements found in the earth are metals, but not all metals may be used in industry. Those metals which are used in industry are called engineering metals. The most important engineering metal is iron (Fe) which, in the form of alloys with carbon (C) and other elements, finds greater use than any other metal. Metals consisting of iron combined with some other elements are known as ferrous metals; all the other metals are called nonferrous metals. The most important nonferrous metals are copper (Cu), aluminum (Al), lead (Pb), zinc (Zn), tin (Sn), but all these metals are used much less than ferrous metals because the ferrous metals are much cheaper.

If we take all the metal produced by the world's metallurgical industry during one year for 100 per cent, we shall see that the production of ferrous metals is about 94 per cent, the production of copper is about 2 per cent, zinc about 1.52 per cent, aluminum about 0.6 per cent, etc.

Engineering metals are used in industry in the form of alloys because the properties of alloys are much better than the

properties of pure metals. Only aluminum may be largely used in the form of a simple metal.

People began to use metals after **wood** and **stone**, but now metals are more important for our industry than these two old materials. Metals have such a great importance because of their **useful properties**. Metals are much **stronger** and **harder** than wood and **that is why** some engineering constructions and machines were impossible when people did not know how to produce and how to use metals. Metal is not so **brittle** as stone which was the first engineering material for people. **Strength, hardness, and plasticity** of metals are the properties which made metals so useful for industry. It is possible to find some very **plastic** wood, but it will be much **softer** than many metals; stone may be very hard, but it is not plastic **at all**. Only metals have a **combination** of these three most useful engineering properties.

But it is much more difficult to get the metals from the **earth** in which they are found than to find some stone or wood, that is why people began to use metals after stone and wood. The first metal which was produced by the people was copper, iron was produced much later.

Different metals are produced in different **ways**, but almost all the metals are found in the form of metal **ore** (iron ore, copper ore, etc.).

The ore is a mineral consisting of a metal combined with some **impurities**. In order to produce a metal from some metal ore, we must **separate** these impurities from the metal; that is done by **metallurgy**.

注 解

1.52 讀作: "one point five two".

0.6 讀作: "zero point six".

etc. (拉丁文 *et cetera*) 等等

that is why 這就是為什麼...

at all — 全然

EXERCISES

I. Form nouns from the following adjectives by adding the suffix *-ness* and translate them into Chinese:

brittle, hard, soft, useful, cheap.

II. Write nouns corresponding to the following adjectives:
important, pure, plastic, strong.

III. Give the Degrees of Comparison¹ for the following adjectives:

hard, important, pure, plastic, brittle, useful.

IV. Change the following Passive² Constructions into Active³:

- a) Metals were used by man after wood and stone.
- b) Many ferrous and nonferrous metals are produced by our metallurgical industry.

V. Answer the following questions:

1. Which metal is the most important for industry? 2. What is an alloy? 3. Can all metals be used in industry? 4. How do we call alloys consisting of iron combined with carbon? 5. Why are ferrous metals used more largely than nonferrous? 6. What properties of metals make them so useful in engineering? 7. Why can not wood and stone be so largely used in industry as metals?

VI. Translate into English:

1. 工程金屬中最重要的是鐵。
2. 它以碳鐵合金的形式應用在工業上。
3. 純鐵不能用在工業上，因為它太軟。
4. 硬性、韌性和塑性是金屬最有用的工程性質。
5. 木料比金屬軟，石塊則比金屬脆。

READING DRILLS

One-Syllable Words

SYLLABLES OF THE FIRST AND SECOND TYPE

Drill 1. First-Type-Syllable Words:

[æ] slab, sat, am, jazz, scrap, tap, ran, chap, sand, scratch, back, bag, can, black, rack, fan, that, than, lap,

1. Degrees of Comparison — 比較等級

2. Passive Voice — 被動語態

3. Active Voice — 主動語態

jam, man, pan, slap, trap, skate, dash, bag, pat, cash, catch, mat.

[e] then, met, men, pen, fence, ten, desk, set, red, jest, less, next, yet, let, yes, send, lend, beg, dwell, gem, sell, swell, yelp.

[i] it, is, lip, kiss, dip, din, sink, link, drink, bill, kid, lid, gin, nudge, bridge, thick, win, thin, wing, fin, sing, inch, pin, rich, bit, till, big, ill, sit, quit, fill, sink.

[ʌ] cup, trust, lust, judge, hurt, plunge, bulge, gust, pug, much, lunch, sun, jump, shut, drag, rust, pluck, such, sung, suck, bus, nut, run, fun, but, bubble, buck, brush, rub, budger.

[ɒ] sob, not, lock, nod, lot, mob, lost, boss, job, bottle, shop, chop, shock, loss, stop, hop, top, on, clock, dog, got, god, sock, shot, dock, blotch, hot, cock, dot, lodge, jot.

[æ] — [e] mat — met, fat — fence, than — then, man — men, pan — pen, slap — slept, sat — set, jam — gem, sand — send, bag — beg, tank — ten, van — yes, Jack — jest.

[æ] — [ʌ] cap — cup, ham — hum, cat — cut, sand — sun, man — much, land — lunch, sank — sunk, sang — sung, ran — run, sack — suck, rang — rung, back — buck, jam — jump, fan — fun.

Drill 2. Second-Type-Syllable Words.

[ei] skate, late, name, mate, page, game, same, plate, save, wave, safe, tale, brave, take, pause, rate, sage, age, date, scrape, bake, place, plane, shade, pale, plane, state.

[i:] mete, these, eve, scene, ice, theme, we, be, she, he, Pete, Swede, Steve, Crete.

[ai] nine, mine, ice, pile, file, nice, I, pine, bite, my, like, type, time, pike, kite, ride, style, dry, dyke, slice, wine, side, mice, mile, five, line, quite, rice, fire.

[ju:] tube, cube, use, fuse, huge, cute, duke, mule, nude, dune, puce, mute.

[ou] stone, no, bone, so, cone, shoe, stove, smoke, rose, close, joke, yoke, woke, drove, hove, love, chose, hope, pose, nose, note, vote, coke, stroke, code.

[æ] — [ei] mat — mate, lad — late, back — bake, scrap — scrape, tram — trade, man — name, pan — pane, rat — rate, bad — brave, bag — age, Sam — same, plan — plane.

[e] — [i:] met — mete, men — me, fence — scene, wedge — we, them — theine, bend — be, hen — he, shed — she, pet — Pete, yet — eve.

[i] — [ai] pick — pike, rid — ride, kit — kite, sick — ice, myth — style, bit — bite, win — wine, lick — like, fin — fine, pin — pine, mill — mile, quick — quite, sin — shine, risk — rise.

[ʌ] — [ju:] cup — cube, us — use, fuss — fuse, cut — cute, plunge — huge, duck — duke, mud — mule, nut — nude, much — mute, tub — tube, dust — dune, pud — pace.

[ɔ] — [ou] not — note, rod — rode, cock — coke, nod — node, shock — smoke, hop — hope, job — joke, top — tone, dot — drove, cop — cope, sob — so, stop — stroke.

Drill 3. Vowel u after r, l, j in Syllables of the Second Type:

[u:] ruse, jute, rule, flute, blue, spruce, brute, June, crude, fluke, truce, rude.

[ju:] — [u:] puce — spruce, nude — rude, tune — rule, use — ruse, mute — jute, mule — flute, fume — fluke, fuse — truce, dune — June.

[ʌ] — [ju:] — [u:] fuss — tuse — ruse, tun — tune — prune, jut — mute — jute, pud — puce — truce, jump — huge — fluke, mud — mule — rule.

Drill 4. Reading of Vowels before combinations ble, tle, dle, gle:

[ei], [ai], [ju:], [ou] noble, bugle, idle, table, cable, title, able, fable, ladle.

able — apple, table — battle, title — brittle, idle — middle, noble — bottle, bugle — struggle.

LESSON 2

Present Participle § 18

Past Participle § 18

Gerund § 22, 23

FERROUS METALLURGY. IRON AND ITS PRODUCTION

As we have seen, ferrous metals are alloys of iron with carbon; these alloys may **contain** also some other elements such as **silicon** (Si), phosphorus (P), etc. but carbon is the most important of all elements present in ferrous alloys.

Ferrous metals are used in industry in two general forms: **cast iron** and **steel**. These two ferrous alloys are **usually** produced from **pig iron** and they have different carbon content. Steel is iron containing from 0.05 to 1.7 per cent carbon, while pig iron is an alloy of iron and carbon with the carbon content more than 2.0 per cent. Pure iron is not used in industry because it is **too soft**.

The furnace that is used for separating iron from the other elements combined with it in the iron ore is called a blast furnace. It is called so because a blast of hot air is forced into it, while producing the pig iron. This is a vertical furnace from 50 to 100 feet high and from 10 to 20 feet in diameter. The walls of this furnace are made of refractory bricks, which can stand great heat.

The largest parts of the blast

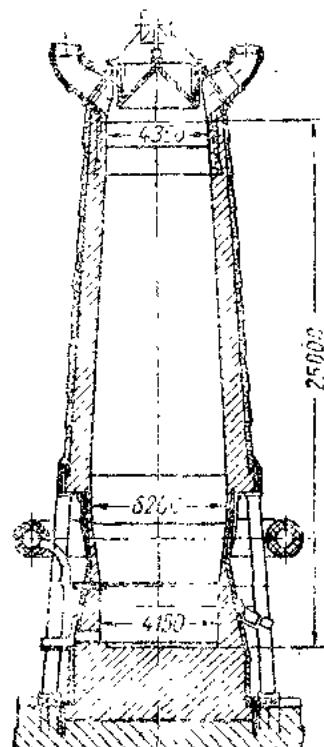


Fig. 1. Blast Furnace.