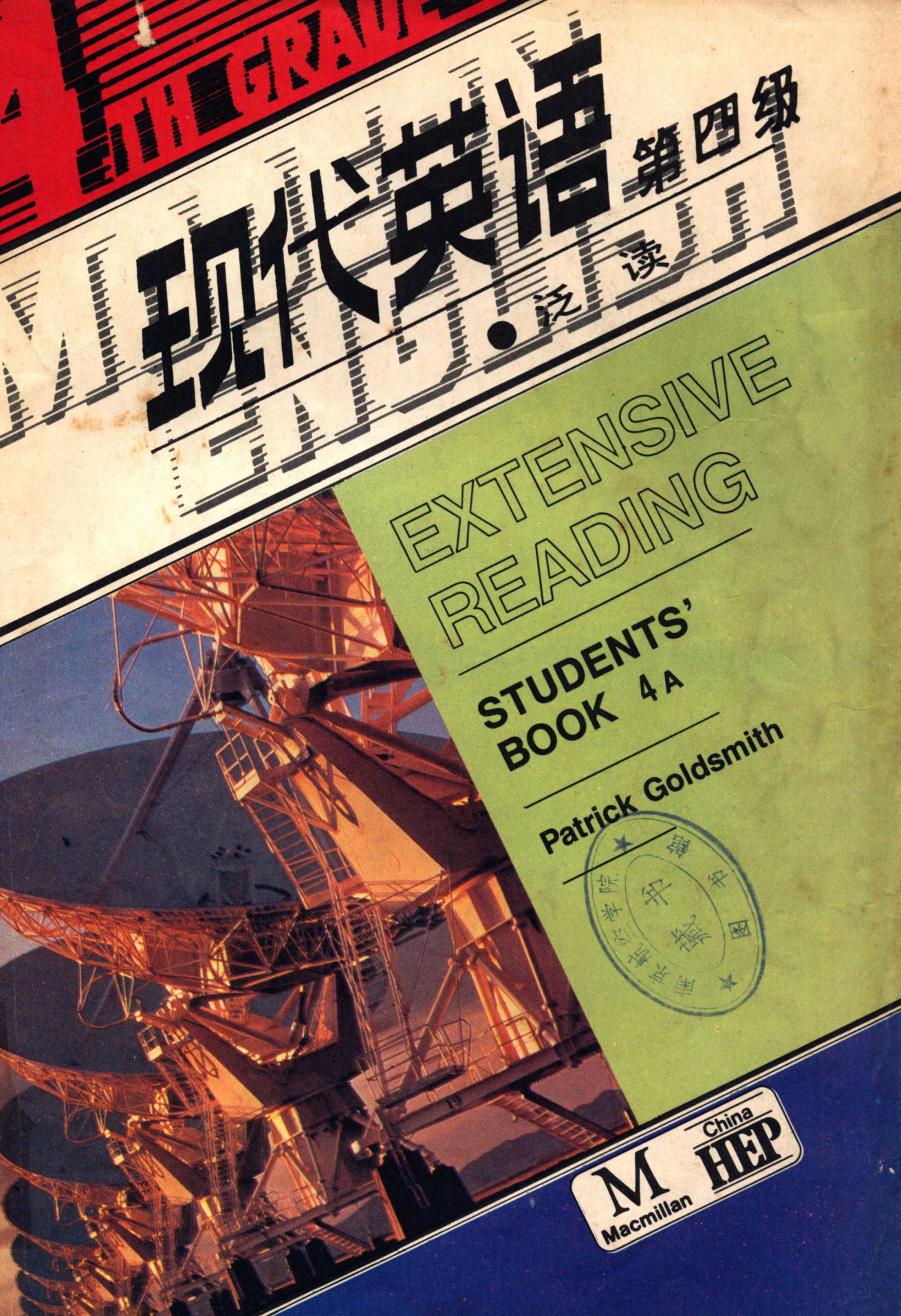




现代英语

第四级

泛读

EXTENSIVE
READING

STUDENTS'
BOOK 4A

Patrick Goldsmith



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MODERN ENGLISH

for University Students

EXTENSIVE READING

Students' Book

Grade 4 A

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现代英语

泛读A

第4级

帕特里克·戈德史密斯

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中国高等教育出版社
英国麦克米伦出版公司

出版

新华书店北京发行所发行

外文印刷厂印装

*

开本787×1092 1/16 印张4.25 字数110 000

1988年3月第1版 1988年3月第1次印刷

印数 000 001-114 300

ISBN7-04-000196-9/H·20 定价 0.90元

ACKNOWLEDGEMENTS

The author and publishers wish to thank the following who have kindly given permission for the use of copyright material:-

BBC Enterprises for extracts from **The Domesday Disks** by Amanda Wood.

Financial Times for an adaptation of **Unnatural Selection** from 5.9.87 issue of Financial Times.

Grafton Books and Roxby & Lindsey Press for extracts from **Future Man** by Brian Stableford.

Macdonald Publishers Ltd for extracts from **Cosmos** by Carl Sagan.

National Geographic Society for an extract from **Every Day is a Gift When You Are Over 100** by Alexander Leaf in National Geographic Magazine Vol. 143, No.1 Jan. 1973.

Personal Computer World for **Memory Media and Optical Disk Hardware** (September 1987issue).

Time for an extract from **Time Magazine** 11.5.87.

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UNIT 1

BEFORE READING

- 1 (a) The following words are important in this text. Look through the list and tick those words whose meanings you are familiar with. Do not look the others up yet in your dictionary. Wait until you come across them in the text. If you still do not understand them, read a little more and see if they are repeated. If by the time you have read the whole text through once you still do not understand them, or are unsure of their meaning, *then* look them up in your dictionary.

armchair
carriage
cell
conduct
design

feature
float
glide
inventor
launch

lift
passenger
pioneer
silk
steady

- (b) Discuss the following questions with a partner.

- 1 Have you ever made a kite? If so, explain to your partner how you made it.
- 2 How many different types of kite have you seen flying?
- 3 Have you seen kites carrying human beings?

READING TEXT ONE

KITE RIDING

Lifting people by means of kites was limited to China until the English schoolmaster George Pocock decided to try it as a follow-up to his attempt to put the horse out of business by developing a system of pulling carriages along roads with kite power. Although the event attracted little attention at the time, a book by Pocock, published after his death, describes a series of tests conducted in about 1825 in which passengers rode into the air in an armchair attached to a kite line. The first of the kite riders was probably the inventor's daughter, Martha Pocock. The account describes how she rose to a height of 300 feet (approx. 100 m) and reports that she was pleased at the easy way the kite moved. Pocock's son also rode in the armchair to the top of a cliff two hundred feet high. The kite itself was made with a covering of sailcloth and was 30 feet (10 m) high.

A basic requirement of a man-lifter is that it should be steady as well as big, but the flat kite of the nineteenth century was not particularly steady. For this reason, the people who were lifted into the air by kites typically did not hold on to the line itself, but were seated in a chair that hung down from the kite. Some improvement came with Captain B.F.S. Baden-Powell's 'Levitor' design of 1894 and later, in which a train of medium-sized kites proved to be as powerful as, and steadier than, a single giant man-lifter of the Pocock variety.

The next logical step was to pull a man-lifting kite, rather than having it tied at one point. The first person to launch a man-lifter by pulling it was a French inventor named LeBris. In 1857 he designed a bird-shaped kite that was launched from a horse-drawn carriage with LeBris lying flat inside the bird's body. The bird rose, but the horse ran wild, the line broke, the end wrapped round the coachman, and the poor man was pulled kicking and struggling into the air.

Among the most impressive of the pulled man-lifters were those designed by Alexander Graham Bell, inventor of the telephone. His largest model was launched by a steamship. It was an immense box kite made of 3,393 silk cells. Bell named the 208-pound (100 kg) kite the *Cygnét* and it was launched over Baddeck Bay in Nova Scotia in December, 1907: a steamship towed the huge kite into the wind and it rose to a height of nearly 170 feet. It floated gracefully for some seven minutes with a pioneer kite rider, US Army Lieutenant Thomas E. Selfridge, lying on his stomach in the centre of the kite. Unfortunately, the members of the crew were so surprised by the sight of a man flying in a kite above them that they forgot to cut the kite's towline when it fell gently on to the water. The kite was dragged through the water and destroyed, but Lieutenant Selfridge survived with only a cold swim in the water.

Dr Bell had previously flown a huge kite, the *Frost King*, with a 165-pound man aboard. The *Frost King* was launched in 1905, also in Nova Scotia, and lifted some 62 pounds of rope and ladder in addition to the unnamed kite rider. The kite contained 1,300 cells made of silk and arranged in twelve layers. There are few details about how the *Frost King* was launched, but Bell was known to use horses to tow kites when there was little wind.

Like the Wright brothers, Bell intended his experiments with kites to provide information that could be used for building aeroplanes. Bell believed that his many-celled man-lifters could be fitted with an engine that would pull the kite forward while at the same time blowing air back towards the kite to give it the necessary lift. Bell finally did produce a plane that could fly in 1908, although it was designed as a biplane rather than as a multi-celled kite. Bell's aeroplanes, the first to fly over Canada, also had such features as a tricycle landing gear and moving sections on the wings, which were new in aeroplane design.

In fact, Bell's aeroplane experiments received more attention than the Wright brothers' work in the first decade of the twentieth century, and many people believed that Alexander Graham Bell rather than the Wright brothers invented the aeroplane. It was through experiments by Bell and the Wrights, using human kite riders, that the big early advances in powered flight were made.

Most kite enthusiasts add a third type of kite riding to the fixed kite and the towed kite: the free glide, or hang glider. This view is not accepted by those who maintain that a kite is, by definition, fixed, and it is certainly true that many gliders owe little or nothing to kites — the long-winged sailplane, for example, does not resemble a kite in any way. Yet, time and again, the inspiration for manned flight has come as often from kites as it has from birds, which provided the inspiration for craft with flapping wings, or wings that closely resemble a bird's in shape. In 1804, the pioneer inventor Sir George Cayley built the first glider by mounting a kite flat on a stick: the kite served as the glider's wings. In 1849 Cayley succeeded in flying a ten-year-old boy in a larger model that he launched by rolling it down a hill. Several years later, Cayley launched his coachman to make a similar flight. Despite the successful flight, the coachman picked himself up, dusted himself off, and refused to work for Sir George any more, saying that in future he would only travel by horse.

Another pioneer flier who deserves mention is the German engineer Otto Lilienthal, who designed and flew on a variety of gliders. Lilienthal, who was born in 1848, began his experiments around 1891; he would grasp the frame of his device about his shoulders and run down a steep hill. When enough lift developed to carry the glider into the air, Lilienthal would draw up his legs and fly like a bird. He made hundreds of such flights, none extending over a distance of more than 1 000 feet (300 m), until one summer day in 1896 when his craft stood still at an altitude of about 50 feet and he fell to his death. Lilienthal is still honoured by modern kite riders as the true father of glider flight, and his birthday is observed each spring by hundreds of American kite riders who gather for competitions.

70 Every schoolboy and girl learns that Wilbur and Orville Wright invented the aeroplane in 1903. What most children do not know is that the Wright brothers were also skilled at the sport of kite riding, in both fixed and free flight. The site of their several years of experiments in riding on a glider modification of a box kite was the same beach at Kitty Hawk, North Carolina, where they later made the first powered flight. Kitty Hawk was a natural setting for kite riding because of the lack of trees and the almost constant wind. In 1902, the Wright brothers were granted a US patent for 'certain improvements' to permit better control of a kite by the person riding it.

75 After the Wright brothers, manned flight was restricted to mechanical devices. In the era of the jet plane, the practice of flying from a kite seemed like a curious late nineteenth- and early twentieth-century idea. But beginning in the 1950s and 1960s, kite riding returned again as the sport of those who wanted to feel the sensation of flying with their own bodies, not through a machine. Modern kite riding is of two kinds: towed flight, usually behind a motorboat, and hang gliding, free flight with a launch made by running downhill into the wind until the kiter becomes airborne.

COMPREHENSION

2 (a) You will probably have noticed that the text is not presented in the order in which the events happened. Find the events in the text that correspond to the following dates:

1804

1825

1848

1849

1857

1891

1896

1902

1903

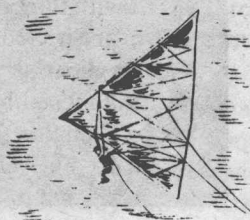
1905

1907

1908

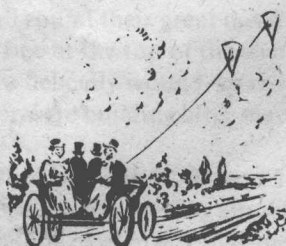
(b) Match the type of flying machine to the drawing that appears to fit the description in the text most closely:

1 Pocock's man-lifting kite



A

2 LeBris's kite



B

3 The Cygnet



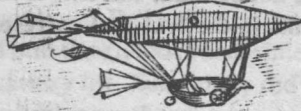
C

4 Sir George Cayley's machine
(with a coachman aboard)



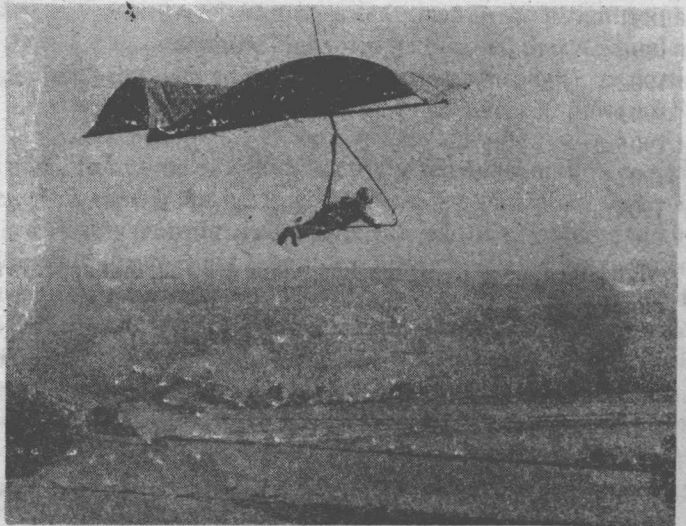
D

5 Otto Lilienthal's hang gliders



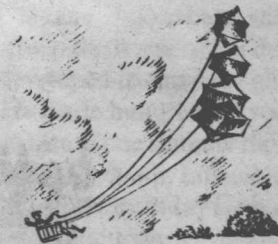
E

6 The Wright brothers' aeroplane



F

7 A modern hang-glider



G

INFERENCE

3 Mark those of the following statements that can be inferred from the text.

- 1 Pocock's kite was probably flat.
- 2 Pocock does not say in his book who the first person to be lifted in one of his kites was.
- 3 The flight of the *Frost King* was less publicised than that of the *Cygnets*.
- 4 Bell flew a kite with an engine.
- 5 Cayley spent all his time working on different kinds of flying machines.
- 6 Sir George did not travel on his flying machine because he did not want to risk being killed.
- 7 The Wright brothers rode on their kites themselves.
- 8 The author of the article is a kite enthusiast.

BEFORE READING

4 The following words are important in the next text. Proceed in the same way as in exercise 1 (a) above, without using your dictionary until you have exhausted all other possibilities.

angular	drum	rod	spiral
blade	pitch (angle)	rotor	thread
collective	propel	rotary	tip
(cross) bow	propeller	setting	twisted
cyclic	radial	shaft	visionary

READING TEXT TWO

THE FIRST HELICOPTERS

At least 2000 years ago the Chinese were playing with simple rotary-wing toys, with two twisted blades sliding freely on a vertical rod. In one version the rod itself forms a twisted helix, and the rotor is swiftly propelled up, spinning as it goes. In another form the rotor blades are mounted on a small drum on which thread is wound. Pulling the thread spins the rotor, which climbs away by itself. By 1800 such toys were common in Western Europe, and Sir George Cayley made some that reached a height of at least 90 feet (28 m).

- Long before Sir George Cayley, visionaries of the Renaissance had begun to dream of mechanical flight in ways other than mere slavish copying of birds, and one of them — Leonardo da Vinci — has left detailed sketches of an 'air-screw' flying machine. In 1784 the French naturalist Launoy, and his mechanically skilled assistant Bienvenu, constructed an outstanding 'Chinese top' with wings 28 feet (9 m) across, which delighted and impressed the French Academy of Science by flying all round their great meeting-chamber. Like many of the best of such devices it had two screws, one at the top of the shaft and the other at the bottom, driven round in opposite directions by a helically wound-up crossbow. By 1828 Vittorio Sarti, an Italian, and Englishman called Mayer were building large machines, and Mayer even tried to fly one with himself on board.

A major step forward was accomplished by W.H. Phillips in 1842. He actually flew a steam-driven model, the first mechanically propelled rotary-wing aircraft (other than toys using stored energy) ever to fly. A feature of the Phillips design was that the rotor blades contained pipes

20 from which the steam issued from holes at the tips. Such tip-drive rotors have many advantages, and became important again after the Second World War.

In the 1860s vertical-rising rotorcraft became a craze. Every well-to-do child had at least one, and countless adults tried to build improved models, some of which reached the proportions of a modern airliner. Some even got off the ground, driven by bows, coiled springs, stretched
25 rubber, steam, compressed air or groups of watchsprings.

One of the more scientific designers was Alphonse Penaud, who also worked on fixed-wing aircraft. At about the time (1870-72) that he was working, the name helicopter at last came into general use for such devices, from the Greek *helix* (a spiral) and *pteron* (a wing). The name stuck, even though everyone soon gave up trying to build spiral wings; long radial ones worked
30 much better.

In 1900 the German, Karl Zenker, completed building his *Bremen 1*, a complicated device with eight lifting rotors and two propellers. It failed to get off the ground. An English rival, George Davidson, spent more than 30 years trying to build a vast flying machine with a fixed wing and lifting rotors, his final Gyropter form of 1911 having two 27-foot (8 m) rotors on each
35 side of a double-deck body that contained the steam powerplant. Though almost completed, at Taplow, in the Thames valley, the Gyropter never flew either.

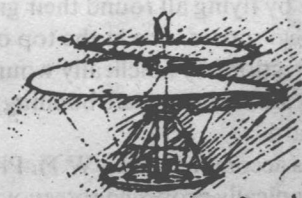
More practical advances were being made, however. In 1904 the Frenchman Charles Renard described ways of connecting rotor blades to the central rod so that they could be angled in any desired direction. Two years later an Italian, G.A. Crocco, patented cyclic pitch control. This is
40 a basic feature of modern helicopters. The lift of a rotor blade depends, within certain limits, on its angular setting to the air. If it is adjusted so that the leading edge rises, it pushes the air down more sharply and gives increased lift; edge-on it may give no lift at all, and if the pitch is made negative it can actually give a downward force.

Crocco saw that if a helicopter was to work properly, the pitch would have to be varied up
45 and down all the time. The 'advancing blade' on one side of the rotor disc would meet the air at its own velocity plus the speed of the helicopter, so it would need to be set at a small angle. The 'retreating blade' on the other side would have a much lower relative airspeed; in fact, if the speed due to rotation at one point was the same as the forward speed of the helicopter, the blade's airspeed would be zero, so it would need to be set at a very sharp angle. Modern
50 helicopters have cyclic pitch control made variable to enable the rotor to be angled in the direction the pilot wishes to go. They also have 'collective pitch', which alters the pitch of all blades at the same time, for rising and descending.

INFORMATION TRANSFER

5 Match the pictures below with the people who invented them.

A George Cayley



B Launoy and Bienvenu



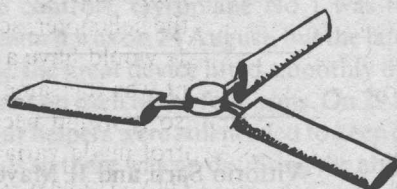
C Leonardo da Vinci



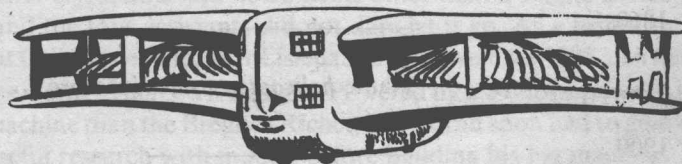
D W.H. Phillips



E George Davidson



F G.A. Crocco



COMPREHENSION

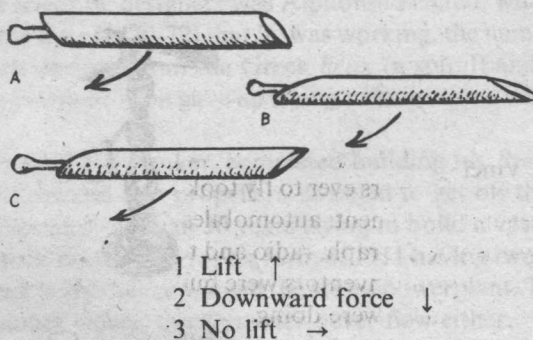
- 6 (a) Decide whether the following statements are true or false:
- 1 The Chinese are known to have flown in helicopters.
 - 2 It took the Chinese top centuries to become known in Europe.
 - 3 Launoy and Bienvenu flew aboard a large 'Chinese top'.
 - 4 W H Phillips flew in his steam-driven helicopter.

T	F
T	F
T	F
T	F

- 5 The name *helicopter* is perfectly suited to the present machine.
- 6 Cyclic pitch control was a major step forward in helicopter design.

T F
T F

(b) Read the text to put the arrows in the right direction on the diagrams below.



SCANNING

7 Scan Reading Texts 2 and 3 for the information needed to complete the following time chart:

100 BC

Chinese tops

Renaissance

1784

Vittorio Sarti and R Mayer build large machines

1842

1860s

Name *helicopter* comes into use

1900

Gyropter finally fails

1904

G.A. Crocco patents cyclic pitch control

Louis and Jacques Brequet's machine

Nov 1907

J. Robertson Porter patents 'turbine machine'

1910

1921

1923

May 1924

READING TEXT THREE

- The first two full-size helicopters ever to fly took to the air in France in the second half of 1907. It was a time of general excitement: automobiles, flying machines, airships and a host of other inventions, such as the phonograph, radio and telephone, were all new developments. All over Europe and America hopeful inventors were building rotary-winged flying machines, and two showed they knew what they were doing.

- One team consisted of the brothers Louis and Jacques Breguet. Their family had been first in the world of clocks in Louis XVI's time, and with wealth and good technical knowledge behind them they began the story of Breguet aircraft. Their first Gyroplane looked like a confused structure of ladders, but was actually a steel-tube frame carrying a 40-horsepower Antoinette engine driving four biplane rotors which provided 32 lifting surfaces. Louis had previously done exhaustive tests of blade (wing) sections, control methods and the whole mechanical design and theory of the helicopter. In this respect he followed the methodical approach of the Wright brothers — not then generally known in Europe — and, like them, he achieved his objective.

- With helper Volumard at the controls, Gyroplane No 1 was first flown at Douai on 19 September 1907 (many reports claim it was on 24 August, but the later date is the accepted one). Despite its total weight of 578 kg, the great device lifted smoothly off the ground to a height of two feet, held steady by an assistant on each of the four arms. On 29 September the flying height was increased to five feet. The four helpers were still needed to keep control, though most of the time they were pulling downwards so there was no doubting the ability of the Gyroplane to fly. It was a great achievement by the brothers, and by Professor Charles Richet whose name is linked equally with their own in this venture.

- Unfortunately this first Gyroplane had no controls other than a simple device to limit the power of the engine, and the four assistants did not dare let it go. As a result, the helicopter flown by Paul Cornu, at Coquainvilliers, near Lisieux, on 13 November 1907, can fairly claim to have been the first in the world to make a free flight. Powered by a 24-horsepower Antoinette, it was a more practical machine than the Breguet-Richet, but Cornu soon had to give up. Like his rivals, he had done careful research with models before building his big machine. He initially used front and rear belt-driven rotors fitted with broad fabric-skinned blades. He added front and rear control planes, but these were not very effective and he knew it would cost more than he could afford to try to go further. It was his bad luck that his efforts came just as the attention of the public had become focused on fixed-wing aircraft and the French visit of Wilbur Wright; otherwise he might have been able to gain support for a more controllable machine.

- In 1908 J. Robertson Porter patented his 'turbine machine', which combined features of the helicopter and hovercraft. In the United States, Wilbur R. Kimball tried to fly a machine with a 40-horsepower engine. In the following year, a young Russian began flight attempts with a helicopter that had only 25 horsepower. In many ways it looked promising, and its contra-rotating rotors were outstandingly good, but it nevertheless just failed to rise. An improved example built in 1910 rose off the ground with its creator standing beside it working the engine,

40 but it could not lift him as well. Discouraged, he turned his attention to aeroplanes, and within a year was building by far the biggest and most powerful aeroplane the world had then seen. It was to be nearly thirty years before his name would be publicly linked with helicopters, yet today he is generally regarded as the man who made the modern helicopter possible: Igor Sikorsky.

45 In Spain, the Marques de Pescara built his first machine in 1919, flew a second machine in 1921 and finally achieved flights of up to ten minutes' duration with No 3, completed in late 1923. Though massive and rather ugly, Pescara No 3 is the first helicopter that actually went where it was told, and it did so at speeds of up to 8 mph (13 kph). Unlike most previous machines, it had a modern movable rotor, with both cyclic and collective pitch control. The pilot steered the aircraft by changing the angle of the rotor disc by the cyclic control, and
50 Pescara even made sure that if the engine failed, the machine would drop back safely to the ground.

Pescara's later helicopter work was done in France, where he had as direct rival Etienne Oehmichen of the Peugeot car company. Oehmichen caused a few smiles by adding a small balloon to his first machine in 1920, though this was a sensible way of adding lift and stability to
55 an under-powered helicopter. His second machine, powered first by a 120-horsepower Le Rhone and then by a 180-horsepower Gnome rotary engine, looked very peculiar with its four great rotors and eight small propellers scattered about over its frame and facing in seemingly arbitrary directions. But in fact it was well thought out, and each propeller had a definite role to play in stabilising the machine or moving it along. By 1924 Oehmichen was making quite good
60 flights, and he accomplished the world's first helicopter closed-circuit flight of one kilometre in May 1924 during a 14-minute flight covering about twice this distance.

COMPREHENSION

8 Decide whether the following statements are true or false according to the text.

- | | | |
|--|---|---|
| 1 The first helicopter ever to fly with someone on board was made in France. | T | F |
| 2 The Breguet family had been famous clockmakers. | T | F |
| 3 The first Gyroplane was a confused mass of ladders. | T | F |
| 4 The Breguet brothers flew in Gyroplane No 1 on 19 September 1907. | T | F |
| 5 Gyroplane No 1 flew with four helpers on board. | T | F |
| 6 An Antoinette was an engine. | T | F |
| 7 Igor Sikorsky made his most successful helicopter in 1910. | T | F |
| 8 Oehmichen's helicopters did not look much like a modern helicopter. | T | F |

COHESION

9 Choose the most suitable completion for each of the following sentences.

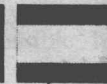
- 1 *two* (line 4) refers to
A flying machines.
B inventors.

- C Europe and America.
- 2 *In this respect* (line 12) refers to
- A the whole mechanical design and theory of the helicopter.
 - B his having done exhaustive tests.
 - C the control methods.
- 3 *their own* (line 21) refers to
- A achievement.
 - B name.
 - C venture.
- 4 *his rivals* (lines 26-27) refers to
- A the Wright brothers.
 - B Louis and Jacques Breguet.
 - C all the other helicopter builders.
- 5 *he* (line 32) refers to
- A Wilbur Wright.
 - B Paul Cornu.
 - C Breguet.
- 6 *its creator* (line 38) refers to
- A Wilbur R. Kimball.
 - B a young Russian.
 - C J. Robertson Porter.
- 7 *his* (line 54) refers to
- A Pescara.
 - B Etienne Oehmichen.
 - C the Peugeot car company.
- 8 The subject of *looked very peculiar* (line 56) is
- A a 180-horsepower Gnome rotary engine.
 - B a 120-horsepower Le Rhone rotary engine.
 - C His second machine.
- 9 *scattered* (line 57) refers to
- A 4 great rotors.
 - B 8 small propellers.
 - C both of the above.
- 10 *it* (line 59) refers to
- A each propeller.
 - B the machine.
 - C the rotary engine.

INFORMATION SEARCH

10

Scan the two texts about helicopters in this unit and place the inventors under the correct flag according to their nationality.

								
	China	Italy	USA	France	UK	Germany	USSR	Spain
unknown inventor	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____