

**EIGHT-PAGE
SPECIAL**

LEST WE FORGET Two World Wars
In Pictures

16

LOOK AND LEARN

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EVERY MONDAY—PRICE ONE SHILLING

**HOW
MAN BREATHES
UNDER THE
SEA** SEE PAGE 24



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OUR COVER PICTURE

For centuries man was unable to explore the depths of the sea, because relying on his lungs alone he could only stay under-water for a matter of seconds. It was not until 1837 that Augustus Siebe invented a flexible diving suit. The diver wore a brass helmet and was supplied with air through a rubber pipe connected to a pump on the surface of the water. Many improvements in diving equipment followed, but it was not until twenty years ago that Commander Jacques-Yves Cousteau invented the aqualung, a new light form of diving gear. For the first time divers had complete freedom to swim about. The aqualung is explained in this week's "How It Works."

BETWEEN OURSELVES

IF you saw a notice in a greengrocer's shop announcing "King Edward Potatoe's," would you at once spot the mistake? If you read a sentence which said "When we arrived, the house was empty, we were told that the owner had gone away," would you think that it was right? Which is correct, "men's woollen socks" or "mens' woollen socks"? Would you write "James' house," or "James's house"? Should you write 'No,' said John, or "No," said John?

That curly little character which is used as a comma, an apostrophe or quotation mark seems to cause more trouble than some of the peculiar rules of spelling in our English language. The unnecessary apostrophe in "potatoe's" is a common sight. In the sentence about the empty house the comma after the word "empty" is just not enough in the way of punctuation—it should

either be a semi-colon or a full stop followed by a capital letter. "Men's woollen socks" and "James's house" are correct. As to whether conversation should be in single or double quotation marks, the double ones are correct, although you will find single quotation marks in some novels.

All this is put into my mind by the fact that a large London theatre has just spent many pounds and valuable hours of labour in erecting a large electric sign—and the finished job has an apostrophe in the wrong place!

Your mistakes are not likely to be so noticeable—but watch them, won't you?

The Editor

Copyright is the right of protection which the law gives to an author, artist or composer, and against persons copying or using the whole or part of their work without permission. The protection lasts for the period of the copyright owner's lifetime and for fifty years after his death.

He Keeps M.P.s in Line

IHAVE often read about the "Whip" in Parliament. Can you tell me who this person is and what he does?

GORDON STRANGER

Holborn, London.
 The Whip is the name of a member of a political party chosen for the special duty of securing the attendance of the members of that party at the House of Commons when they are needed to vote. The term is an abbreviation from the whipper-in of a pack of hounds (a hunt servant whose job it is to keep the hounds under control and assist the huntsman).

Radium

WHO discovered the rare metallic element radium, which has helped so much in the treatment of cancer and skin diseases?

JEAN SUTHERLAND

Edinburgh, Scotland.

Radium was discovered by Marie and Pierre Curie, husband and wife physicists. They began their research in 1890 by examining pitchblende (a natural mineral) to see what other radio-active substances it contained besides uranium. They found a new substance which they called polonium, and further research led to the discovery of radium, an entirely new element.

Indian Raft

CAN you tell me what a Balsa is? CHARLES GREEN
 Plymouth, Devon.

A Balsa is the name of a raft used by the South American Indians. It consists of two floats made of balsa-tree logs connected by framework. Another kind is made of skins stretched over a wicker-work.

£5 Stamp

STAMP collectors may like to know that the most expensive postage stamp ever issued in this country was the £5 Great Britain stamp. It was first issued on March 21, 1882, in the reign of Queen Victoria. It has since been withdrawn.

RICHARD HAZELDINE

Oxford.

Protection

IHAVE often noticed the word "copyright" printed in LOOK AND LEARN. What does it mean?

FRANCIS MAYER

Kingsbridge, Devon.

"God Save The Queen"

READERS of LOOK AND LEARN may like to know that Britain's national anthem "God Save the Queen" is one of the most famous of all national anthems. It dates from the eighteenth century, but its origin is in doubt. With different words it has been the national anthem of Switzerland, Denmark, and Germany until 1918.

JENNIFER MARLOW

Auckland, New Zealand.

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Quick Quiz

LITERATURE

- Which of the following works was written by Miguel Cervantes: (a) Le Misanthrope, (b) Don Quixote, (c) Reliques of English Poetry?
- What was the Christian name of Dean Swift's Gulliver?
- Two famous English essayists are linked with the birth of *The Tatler* and *The Spectator*. Who were they?

SCIENCE

- What is the name given to a chemical ferment produced by the living cells of a plant or animal?
- Where in the human body would you find the pyloric valve?
- "The angles between the faces of crystals are always the same." Is this statement true or false?

HISTORY

- To which royal house did Henry IV, Henry V and Henry VI of England belong?
- For how many days did Lady Jane Grey reign?
- Which English King married Berengaria of Navarre?

COUNTIES

- In which English county is Newstead Abbey?
- Which is the smallest county in Wales?
- In which Northern Irish county would you find the rivers Lagan, Bann and Newry?

GEOGRAPHY

- Which sea washes the coast of Eritrea?
- Taiwan is the Asiatic name for a Far Eastern island. What do Europeans call it?
- Where would you find the Aegean Sea?

ANSWERS ON PAGE 20

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THE SEARCH FOR SUPER-STRENGTH

THIS
MODERN
AGE

SINCE the far-off days of the Stone Age when our primitive ancestors slowly and laboriously chipped flint and stone to make their weapons and tools, man has searched for ever-stronger materials to build and fashion the things he needs. Indeed, it is upon the strength of materials that our civilization depends and advances.

Stone gave way to stronger bronze. Then bronze was replaced by iron because it was stronger.

In the eighteenth century the art of wrought and cast iron was discovered. And by the following century it had been made strong enough to build steamships like the Great Eastern and huge structures like the Eiffel Tower.

Then came the discovery that adding carbon to iron turned it into steel and multiplied its strength ten times.

Steel gave engineers a material strong enough to build skyscrapers; erect bridges that swept across rivers in great single spans; and build ships of 100,000 tons.

But the search for still stronger and stronger materials goes on. And scientists are solving the problem with what are called "super-strength" materials.

One of the latest of these super-strength materials is metal "whiskers."

Microscopic examination has shown that metals are made up of tiny crystals, and that these crystals are themselves thousands of times stronger than the metal as a whole.

By treating the metal in such a way that the crystals are arranged in certain patterns, the strength of the metal can be greatly increased.

The crystals are, in fact, made to form themselves into thousands of strands or whiskers. The whole idea developed from the knowledge that many materials are much stronger when used in the form of wires or bundles of fibres.

A steel wire, for example, is stronger than a steel rod containing the same amount of the metal.

One reason for this is that the process of making the wire by successively drawing a piece of steel through smaller and smaller holes in a hardened

It began with bits of stone, and turned to iron and steel. Now scientists, looking for even stronger materials, have invented steel with whiskers!

The threads supporting this car are each only one-thousandth of an inch thick. But they are made of one of the new super-strength materials which combine lightness with extreme toughness.



metal plate or "die" tends to squeeze away most of the microscopic cracks and flaws which exist in even the most carefully manufactured steels.

Certain metals can be heated until they actually "boil." When the hot metal vapour is suddenly cooled it hardens into fine hairlike crystals or "whiskers."

These "whiskers" are fantastically strong, and can resist forces of millions of pounds per square inch.

By binding these whiskers together with plastic or soft metals, very strong "whisker plastic" results.

In doing all this, of course, scientists have simply been imitating what nature has done with wood. The "grain" of wood is simply the bundles of cellulose fibres held together with a special type of binding medium or natural "glue" called lignin.

New Materials

THE lightest and yet strongest form of wood is bamboo, whose thousands of hairlike fibres make it as strong and light as aluminium tubing.

Now scientists are inventing new materials which, by comparison, make steel seem as weak as paper.

The strands of the sling holding up the car in the photograph on this page are each only one-thousandth of an inch thick. Yet the car weighs over half a ton.

Glass is a fragile material—as we soon learn to our cost when we drop a tumbler or throw a ball through a window. Nevertheless, even glass can be turned into a super-strength material.

If glass is softened by heating it can be pulled into very fine fibres which are many times stronger than "normal" sheet glass. Special machines can use this heating and pulling process to produce bundles of fine glass fibres which look like skeins of white wool.

The glass "wool" is then mixed with a liquid plastic which hardens under the action of heat, binding the fibres of glass wool together. The result is an intensely strong material which is now used to make car bodies, bath tubs, furniture and even the hulls of sailing boats.

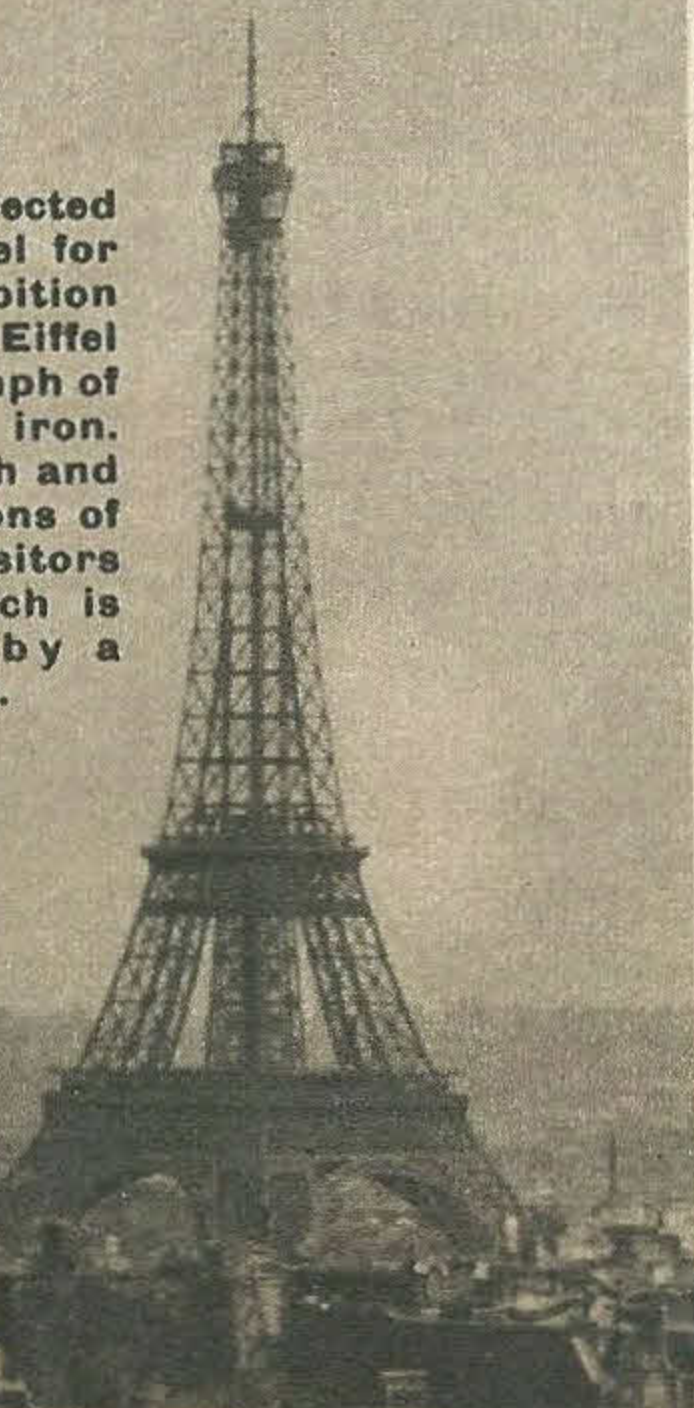
One of the strongest materials in the world is a synthetic or man-made fibre made from coal, air, and water, and called nylon. Some of the threads made from it have a tensile or pulling strength greater than that of a steel wire many times thicker.

Nets made from nylon are so tough that they are used on aircraft carriers to stop jet fighters that overshoot the landing area.

Nylon is not affected by extreme cold, it does not rot, and is proof against most chemicals.

Research into new ways of producing these super-strong materials is extremely important in this space-age—ordinary materials simply will not stand up to the incredible stresses and strains of space journeys and supersonic flight.

Designed and erected by Gustave Eiffel for the Paris Exhibition of 1889, the Eiffel Tower is a triumph of engineering in iron. It is 984 feet high and contains 7,300 tons of iron. Lifts take visitors to the top, which is surmounted by a radio aerial.



THERE was something horribly sinister about the twelve stoutly-built Genoese galleys which meandered into the harbour of Messina in Sicily one fine day in 1347.

The population of the town who turned out to meet them saw that the crews were delirious. Many had already died.

But disease in the Middle Ages was part of the insanitary make-up of everyday life and the arrival of the sick seamen did not cause much of a stir.

Soon, however, the population of this rough and raw Sicilian port began to succumb like flies from the same symptoms as the visiting crews.

The disease, which lasted three violent days, usually ended on the fourth with death. Soon the whole town was a pathetic sight, a gloomy morgue of locked doors and hungry dogs yapping at street corners.

As soon as the population realized that the Genoese galley crews were responsible for bringing in the disease they hurriedly rushed them out of port. But too late. The disease, or rather plague, had already shot like wildfire into the rest of Sicily, slaying vast numbers in villages and towns.

The name the people gave to this extraordinary plague was the Black Death—probably the worst single disaster to strike Europe in the Middle Ages. A bubonic plague, it swept over the Continent and was responsible for not only wiping out the bulk of medieval society but also for changing the social structure of the times.

After the Black Death had passed, the old conception in Britain of lord and serf disappeared. The shortage of manpower at last gave the humble serf his chance to establish his right to better pay and better conditions. But what a



In the Middle Ages there was no medical knowledge to help them combat the dread disease. All they could do was hope and pray—or try mystic "cures."

WHEN THE BLACK DEATH STRUCK

In Europe 42 million people died. In England,
half the population was wiped out.

This was the terrible toll of the world's
worst-ever plague

sacrifice was made before this eventually happened.

The Black Death struck Britain in 1348. The manner in which it scythed its way through villages and towns is naturally not so well recorded as the Great Plague of London three hundred years after it, but we know it caused similar havoc and started an avalanche of panic among rich and poor. But unlike the Great Plague, there was no Great Fire of London, as there was in 1666, to put a stop to the spreading germs. The Black Death drifted away slowly.

Bristol, for instance, was hit savagely and nine-tenths of the population wiped out. Messages were sent by primitive means from London to suspend all communications between Bristol and the rest of the country.

Elsewhere entire villages were wiped out, and by the time the Black Death eventually subsided, after sixteen months, Edward III's subjects had been reduced from about four million to two and a half million.

Ploughmen died, crops withered away, robbers roamed the forests and the national scene was bleak.

But the plight of other European countries was even worse. For instance, in Italy the death rate in towns was appalling. In Venice about 100,000 people died from the plague, in Siena 80,000. In Germany the figures were nearly as high. In the year 1348 the fantastic figure of 1,244,434 deaths was recorded in Germany. It is believed that half the French population died from the plague.

Slow Spread

How did it start? The popular conception is that it formed in China in 1333 by means of a foul fog infecting the air. Slowly the disease spread through the East carried by various commerce routes until it reached Europe, where it wrought havoc for a number of years. The number of deaths in the world recorded by its hand was said at the time to be 42,836,486—not far below the present population of Great Britain.

When it reached Europe it spread by means of ships, locusts, white mice, black rats, fleas and other vermin. The sanitary arrangements at the time being almost non-existent, it was not surprising it got such a hold on populations.

Superstition, witchcraft, cannibalism, vile remedies and persecutions, they all blossomed as the plague took a hold. At first doctors and priests, completely overawed by its strange power, refused to go near the sick. But there are records of priests carrying hundred of corpses to burial and still surviving.

Normal living rapidly disappeared, to be replaced by a frenzy of hysteria. In Germany the Jews were persecuted savagely as scapegoats for the arrival of the Black Death. They were accused of poisoning wells and thus starting the plague. Their persecution was inexplicable, but at times of disaster someone always seems to have to shoulder the blame, no matter how innocent.

In other countries gangs roamed the country plundering and stealing and causing general havoc. Wild animals took over entire villages while groups of flagellants wandered along the highways expressing their terror by beating themselves with whips. Men pretended to be wolves and raided houses in their hunger to kill and eat other humans.

The Bells Rang

SUPERSTITION was predominant. In Italy the sight of comets moving through the sky and erupting earthquakes were thought as being a sign of impending plague.

There were some odd remedies to counter the plague. Many of them were unbelievably crude but the true meaning of germs was still a mystery at that time. Some families kept dead animals and live billy goats in their houses believing the smell would keep away the plague. Spiders were also popular as poison absorbers.

When the plague abated a wild orgy of living sprang up, aimed at slashing away the image of death. All over Europe bells rang and people danced in the streets. Some of the dances were symbolic, for instance The Dance of Death. Marriages among the survivors flourished and the populations of towns rapidly increased in size again.

Now, with the end of the Black Death, came a change in social conditions. In Britain during medieval times the farm labouring system of today was non-existent. Serfs were at the complete mercy of their lords. It was a primitive system and the serfs were no more than slaves toiling year in and year out for a pittance.

The Black Death wiped out so much of the population that the lords faced a great labour shortage afterwards. The serfs asked for higher wages and the situation became difficult for those who had lived by suppression. Never again were the lords able to govern so harshly on such cheap labour.

As for bubonic plague, it still has not completely died out in the world. But now with modern medicine it only causes a minimum of deaths. Terrifying plagues like the Black Death could never, thank goodness, occur again.



Eager hands hauled the boats ashore—and began a trail of terror that was to cut like a scythe across Europe. But who was to know that the ailing seamen heralded the coming of the Black Death?

NTDAR

JOHN AND JANE CITIZEN
learn about life around us

GUARDIANS of our COUNTRYSIDE



Thousands of acres of Britain will always remain unspoiled for our enjoyment—protected for us by the work of the National Trust

FIVE hundred years ago, after a thrilling chase through south-west England, a Cornish knight jumped dramatically from a towering headland near Mevagissey to escape his pursuers. The knight, Sir Henry Trenowth of Bodrugan, was a supporter of Richard III, who came to the throne in 1483. His rival was Sir Richard Edgcumbe who drove Sir Henry from the country after Henry VII overthrew Richard III.



Britain must have millions of new houses and buildings—but not at the expense of our beauty spots and the still unspoiled countryside.



How well it fits into the countryside, this ancient stone bridge at Ashness, Cumberland. It is preserved by the National Trust, which owns much ground in this lovely area.

To elude Sir Richard's men, Sir Henry sprang from the cliff into the sea, where he was picked up by a friend in a boat and rowed to France.

Today, you can relive this adventure in your imagination on the Cornish headland, called Bodrugan's Leap in memory of it. You may wander at will over the scene preserved in its natural beauty by the National Trust.

If it were not for the Trust, a voluntary body helped by the government but not connected with it, we should be unable to visit freely thousands of lovely acres like Bodrugan's Leap that might otherwise have been built upon. We should be unable to tour the carefully preserved ancient houses where many famous people have lived, to see the castles and country estates that figure in our history, or admire the nature reserves and beautifully cultivated gardens.

For these pleasures, we owe a debt to the National Trust, which was formed in 1895 to prevent the spoiling of the countryside. It succeeded so well that today it owns more than 1,000 places (including farms, whole villages, historic ruins, mills, abbeys, a medieval inn and post office, an eighteenth century cotton mill and the ancient remains of Hadrian's Wall) and more than 300,000 acres of land. It also protects the beauty of a further 50,000 acres.

Some of these were bought by the Trust and others were presented by their owners along with sufficient money for their upkeep. Otherwise the

Trust gets its money from membership subscriptions, the rent and profits of land, forests and farms, gifts and legacies, and the admission fees we pay to see the Trust's places.

Luckily, the Trust does not have to pay taxes, and the government has presented it with such historic places as Penrhyn Castle, which was handed to the nation in payment of death duties.

The day-to-day work of the Trust is carried out by a staff of forty paid officials in London and at fifteen area offices in England, Wales and Northern Ireland.

Scotland, incidentally, has its own National Trust doing equally important work.

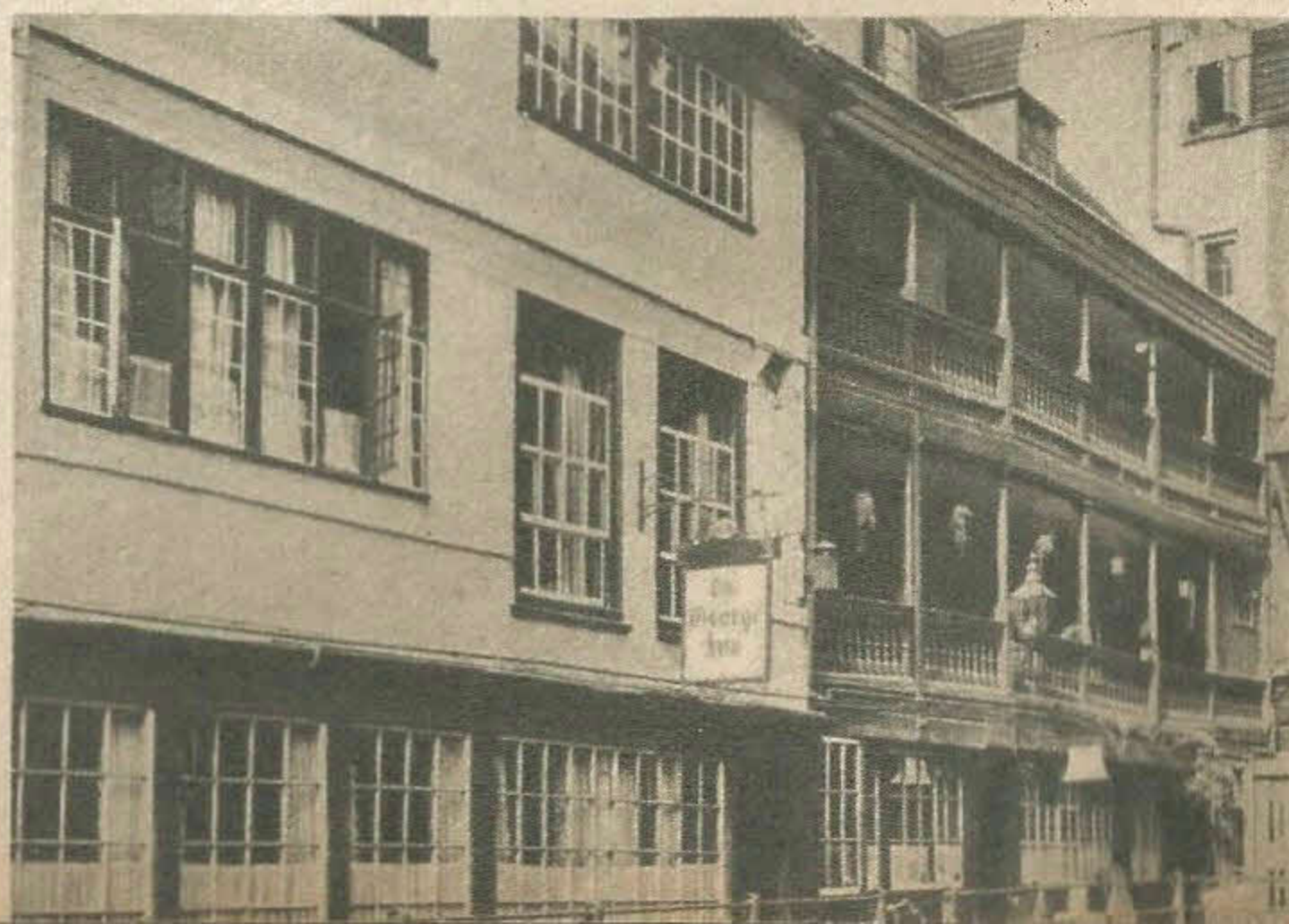
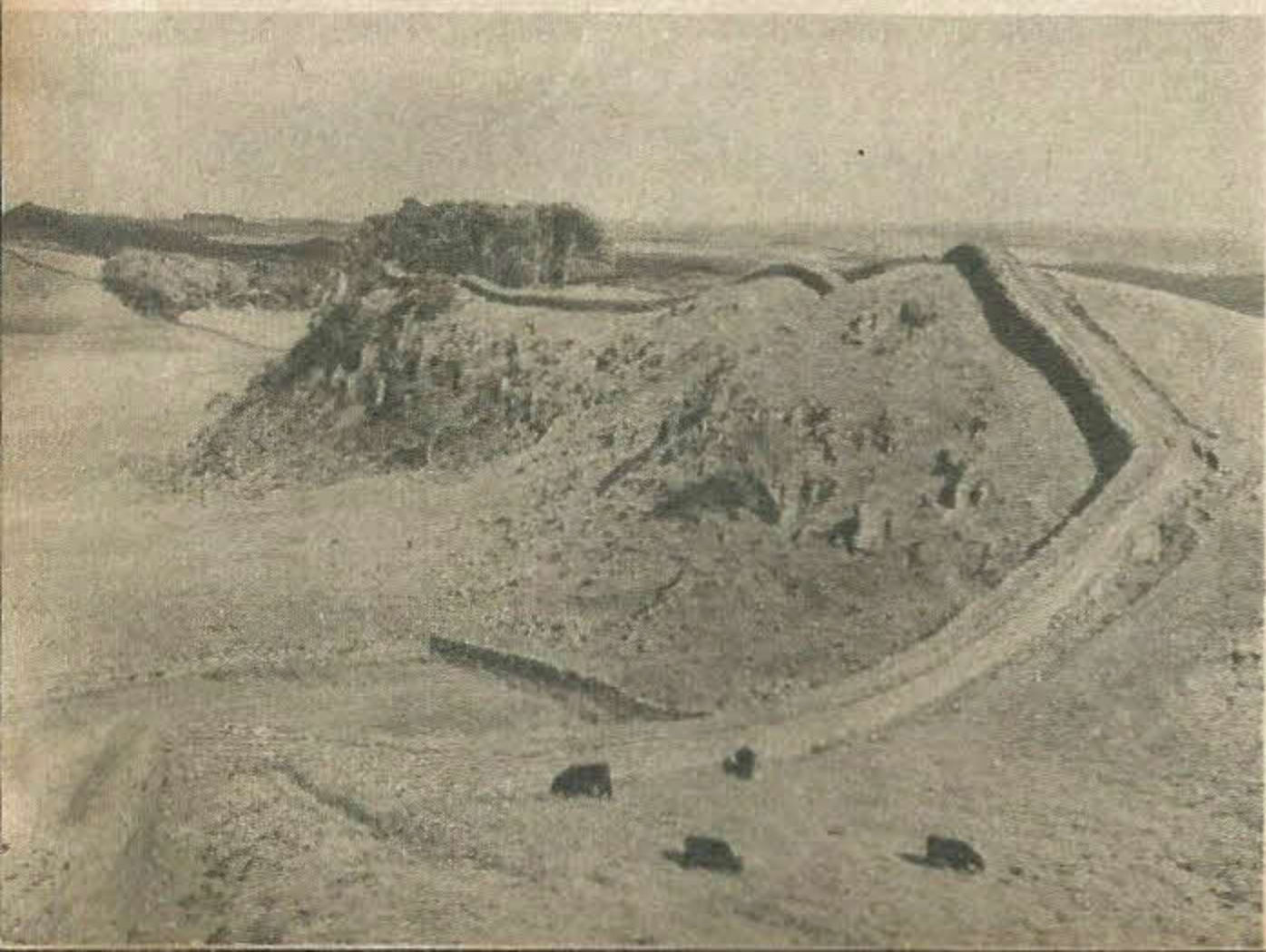
When you go exploring in Britain, look for the sign of an oak leaf. That is the symbol of the National Trust's work in preserving our country's beauty and history.

YOU TOO CAN HELP . . .

If you would like to help preserve fine buildings and scenery in Britain, you can join the National Trust. Members of this independent body of private citizens pay an annual subscription, receive reports and news letters, and are entitled to free admission to Trust properties where a fee is charged. For further details, write to the National Trust, 23 Caxton Street, London, S.W.1.

◀ Hadrian's Wall, the former Roman fortification in Cumberland, is Trust property. This is Cuddy's Crag, as it has looked for hundreds of years to walkers and local farmers.

▶ The last stage coach has long ago rattled out of the courtyard of the George Inn at Southwark, London, but its ancient beauty will not be lost to us. We can still see it as it was in Shakespeare's day.



WARRIORS OF THE PLAINS

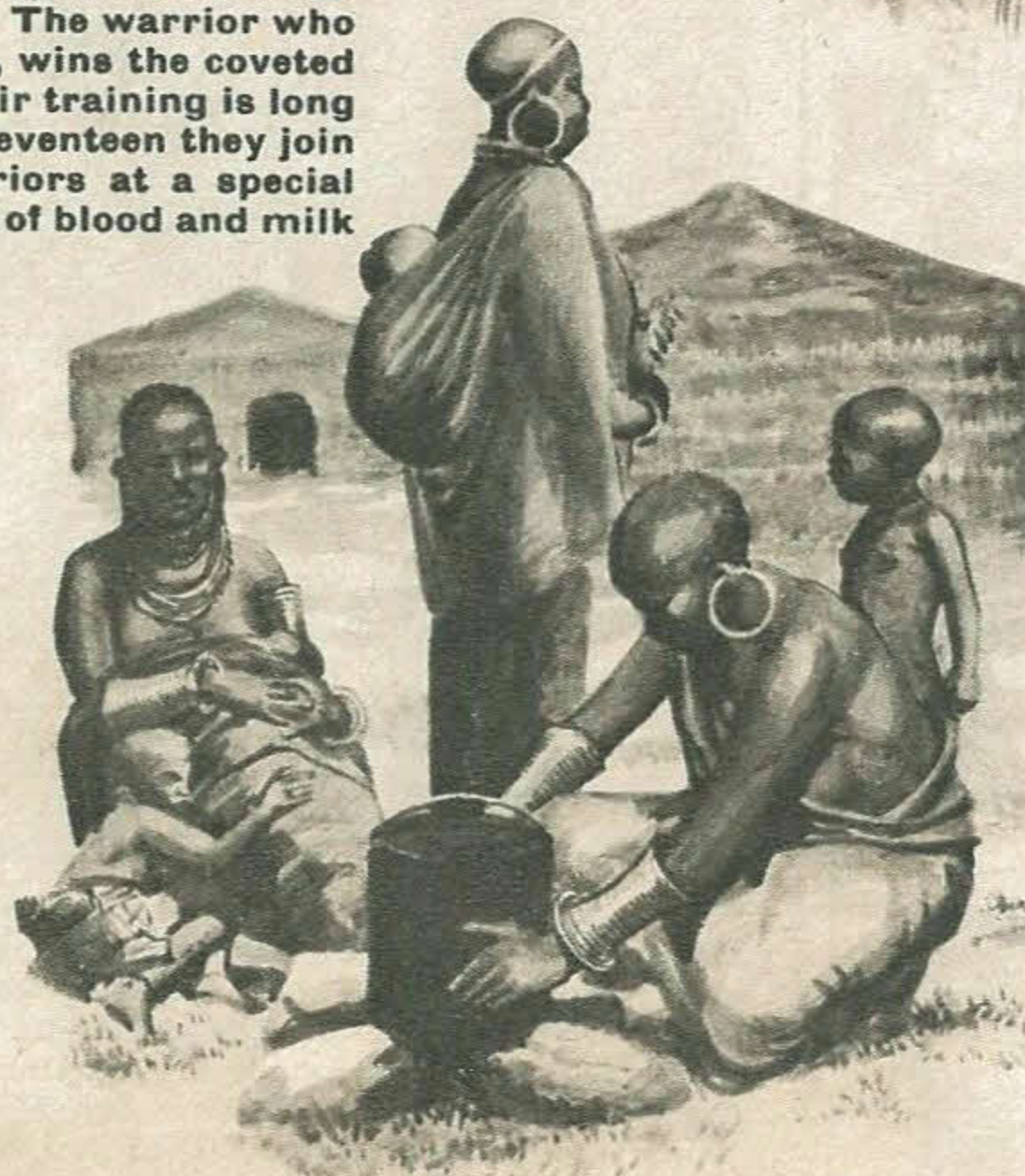
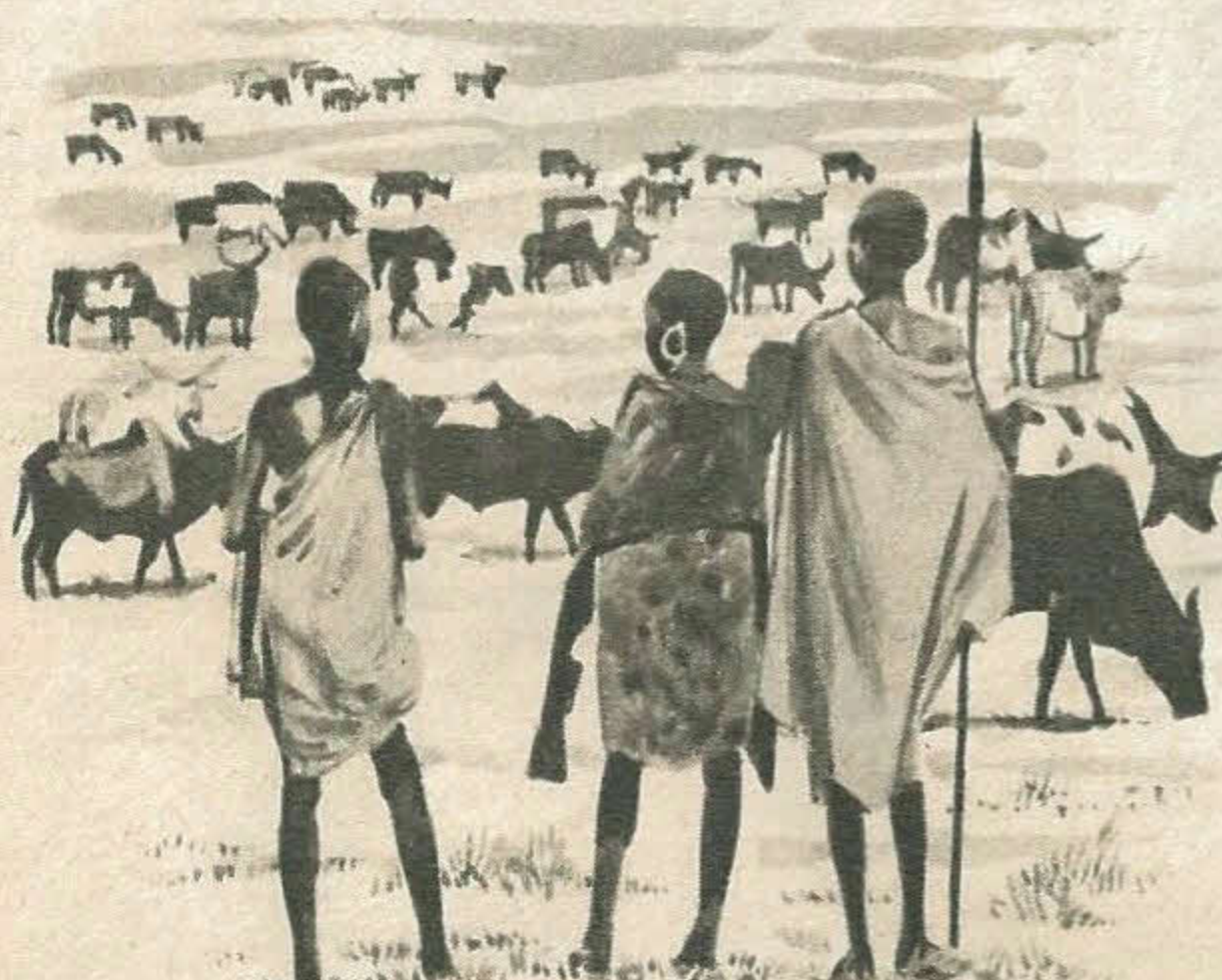
THE Masai are a proud, fierce people. Once great warriors, they were the scourge of East Africa, raiding neighbouring tribes and stealing cattle. Today they still preserve their warlike way of life, despite the coming of the white man. A light-brown people with handsome features, the Masai live in special reserves on the plains of Kenya and Tanganyika. Unlike the Kikuyu people of Kenya, they take little interest in politics and are actually contemptuous of the white man's way of life. They regard themselves as superior to all other people, and believe that their life, with its rigid tribal discipline, is supreme. Contact with Europeans is gradually increasing on the fringe of the reserves, but the Masai will seldom work for white people. Two other tribes live and work with them as inferiors—the Kunono people and the Dorobo tribe.



Masai people are fond of ornaments and wear numerous earrings, bracelets and necklaces. Women wear sandals and apron-dresses of goatskin. Men dress in togas of imported calico.



Wearing lion-maned headdresses and carrying buffalo-hide shields, these warriors (*Moran*) are hunting lions and leopards that molest their cattle. The warrior who throws the first spear, or the one who grabs the lion by the tail, wins the coveted prize of the lion's mane. The *Moran* dominate the tribe, and their training is long and strict. Boys begin training when they are thirteen, and at seventeen they join the *Moran* class. After four years they are initiated as warriors at a special ceremony after which they are free to marry. They live on a diet of blood and milk from cattle, but seldom kill game for food.



Far left: Cattle are the sole wealth of a tribe. Guarded by boys and old men, the cows with curved horns and humps are valued above everything else and even given names. But the poor land will not support the increasing size of the herds. The Masai population is dwindling and in order to survive they have had to adopt some modern schemes like proper water supplies and pest control of the tsetse fly which causes sleeping sickness. Left: Homes are oval huts made of brushwood and mud set in a circle. The whole encampment is surrounded by a thick brushwood fence. Masai warriors take several wives, and each wife has a hut for herself and her children, the whole family living in a group of huts. The *unoto*, or warrior ceremony to initiate youngsters, is held every seven years in a special village built by the women. The families are housed in about 160 huts in a circle round a ritual house.

CROSSWORD

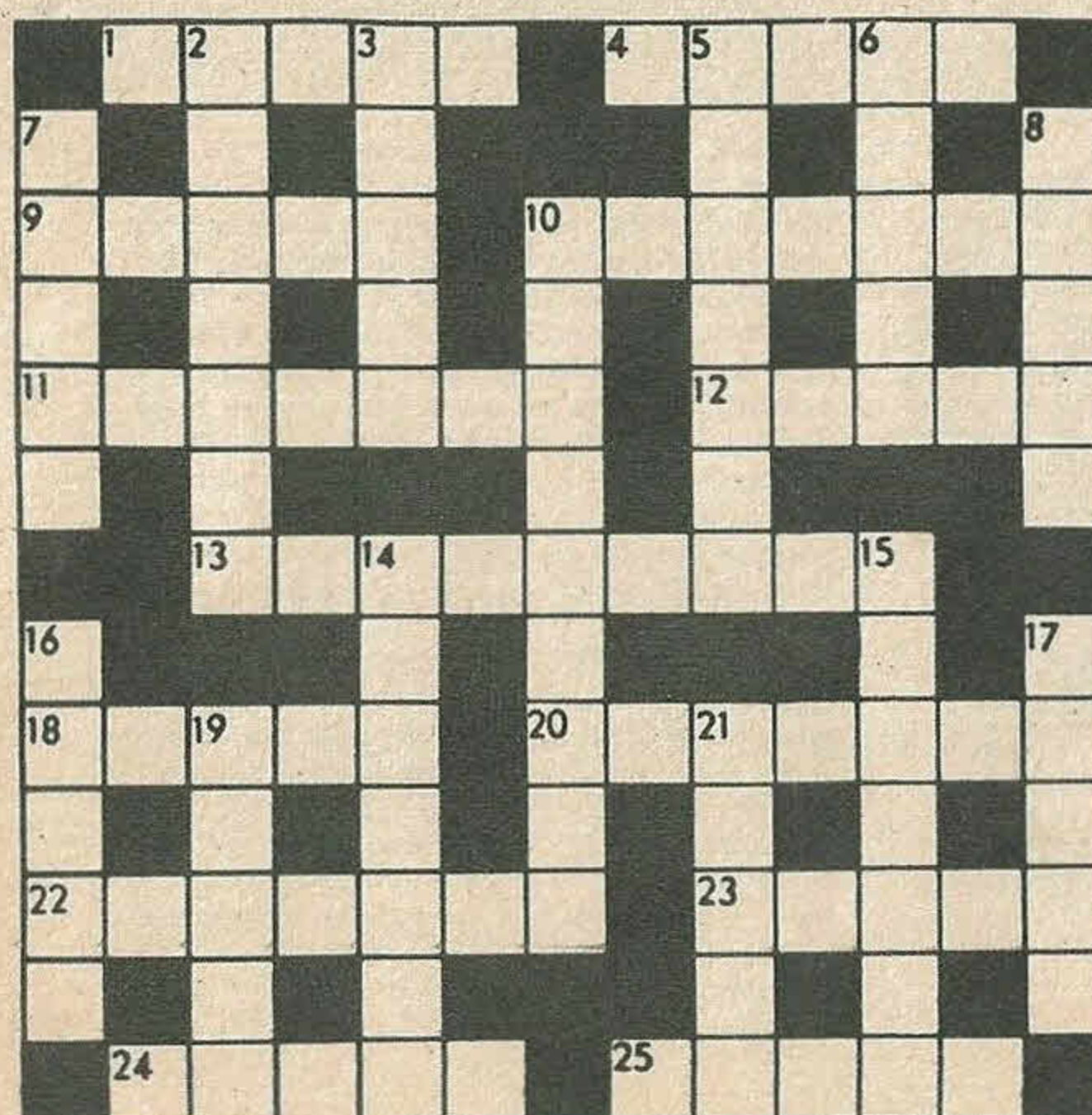
ACROSS

1. A Catherine — is a firework (5)
4. A ship that has been sunk (5)
9. To "let sleeping dogs lie" means to — well alone (5)
10. A case in a court of justice (7)
11. This kind of examination is not an oral one (7)
12. This lake is formed when a river bends back on itself (2-3)
13. He tried to blow up the Houses of Parliament on November 5, 1605 (3, 6)
18. Fine cloth for which Ireland is famous (5)
20. A rotary motor such as is found in power-stations (7)
22. To turn this means to refuse to listen (4, 3)
23. This is an R.A.F. word which means the sea (5)
24. An indoor game using pawns, bishops, knights, etc. (5)
25. What the school year is divided into (5)

DOWN

2. A doctor devotes his life to — the sick (7)
3. Anything that happens—or a race in a swimming gala (5)
5. The U-shaped piece of iron that an oar fits into (7)
6. This piece of bread is important to a sparrow (5)
7. A church organ has to be this; it used to be done by a hand-lever (5)
8. Nourishing meat dishes with lots of gravy (5)
10. One of the two rival Houses in the Wars of the Roses (9)
14. These were the Northerners in the American Civil War (7)
15. The Latin name for antimony, which explains its formula—Sb (7)
16. A leaf of grass, or part of a pocket-knife (5)
17. A small dull coloured wall lizard (5)
19. Poetic word meaning "below"; also name of a Welsh rugby club (5)
21. Dickens wrote a book called "Barnaby —" (5)

SOLUTION ON PAGE 20



WONDERS OF NATURE:

WHAT DO ANIMALS

The fact is, animals' lives are ruled by signs. When you can read the signs you will see that most animals are not half as clever as you think they are

IF you look at an animal in its natural surroundings, it will probably strike you as very practical and sensible in all that it does.

Take a robin nesting. When the nesting site has been found, the nest is built, the eggs hatched and the young are then carefully fed until they are old enough to fend for themselves. All these activities are carried out with an air of determination and purpose, as though the robin knew exactly what it was doing and where it was going.

Or take a fussy hen, clucking around her chicks. Every so often one strays too far from the brood,

and the hen darts after it and shepherds it back, the very picture of motherhood.

Often animals seem to be even more sensible and orderly than we are. In an ant colony, every ant has its appointed task—such as collecting food, or guarding the ant nest. No ant ever rebels against his lot, or starts a war. Everything proceeds calmly and peacefully, and each ant works for the good of the whole community.

Yet although ants *look* intelligent, we have to ask ourselves—are they really? Do animals really know what they are doing, and why they are doing it?

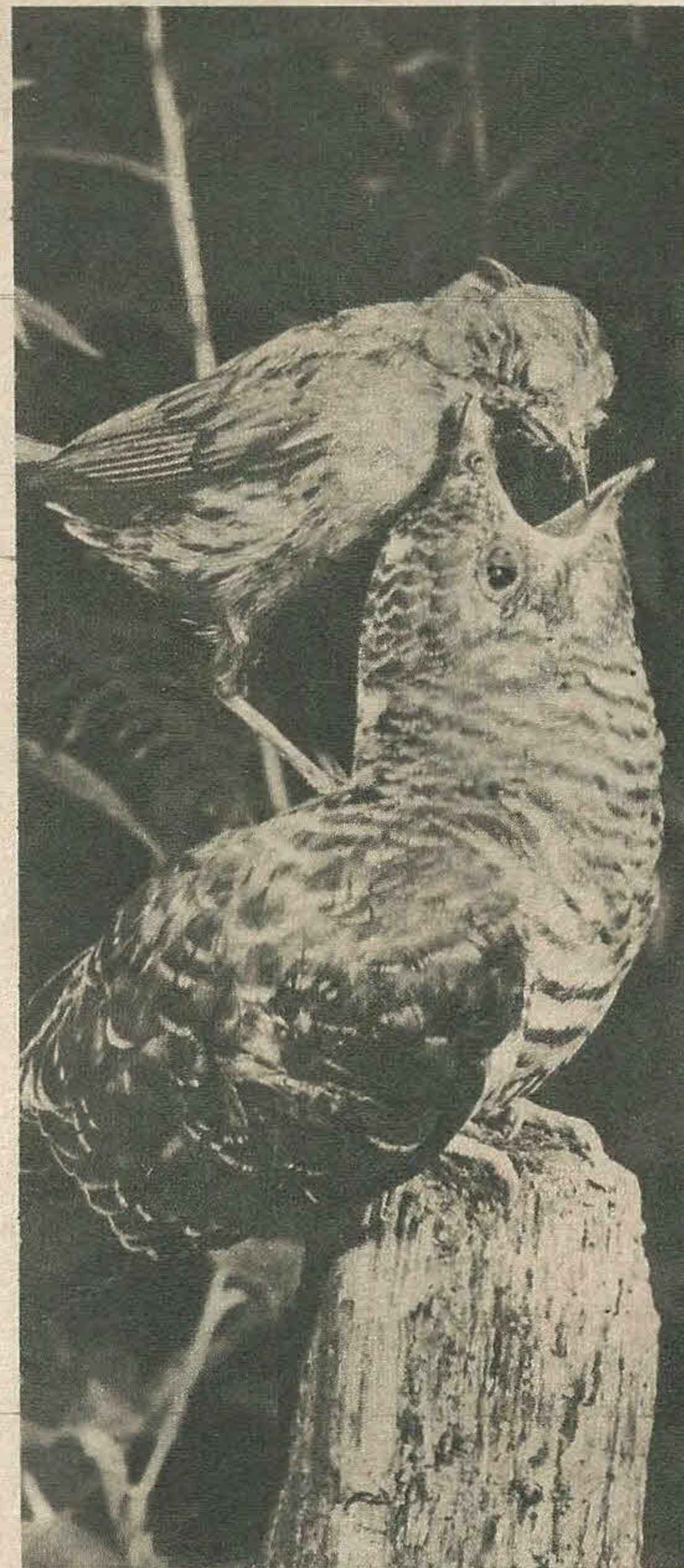
The answer is that in many cases animals do not act intelligently but "instinctively." When an animal acts instinctively, it acts blindly, as though driven by some force inside it.

When a robin builds his nest, carefully selecting the right twigs and pieces of moss, he is not thinking at all; he is simply acting out a pattern of behaviour that he has no control over, and he has no real insight into why he behaves as he does.

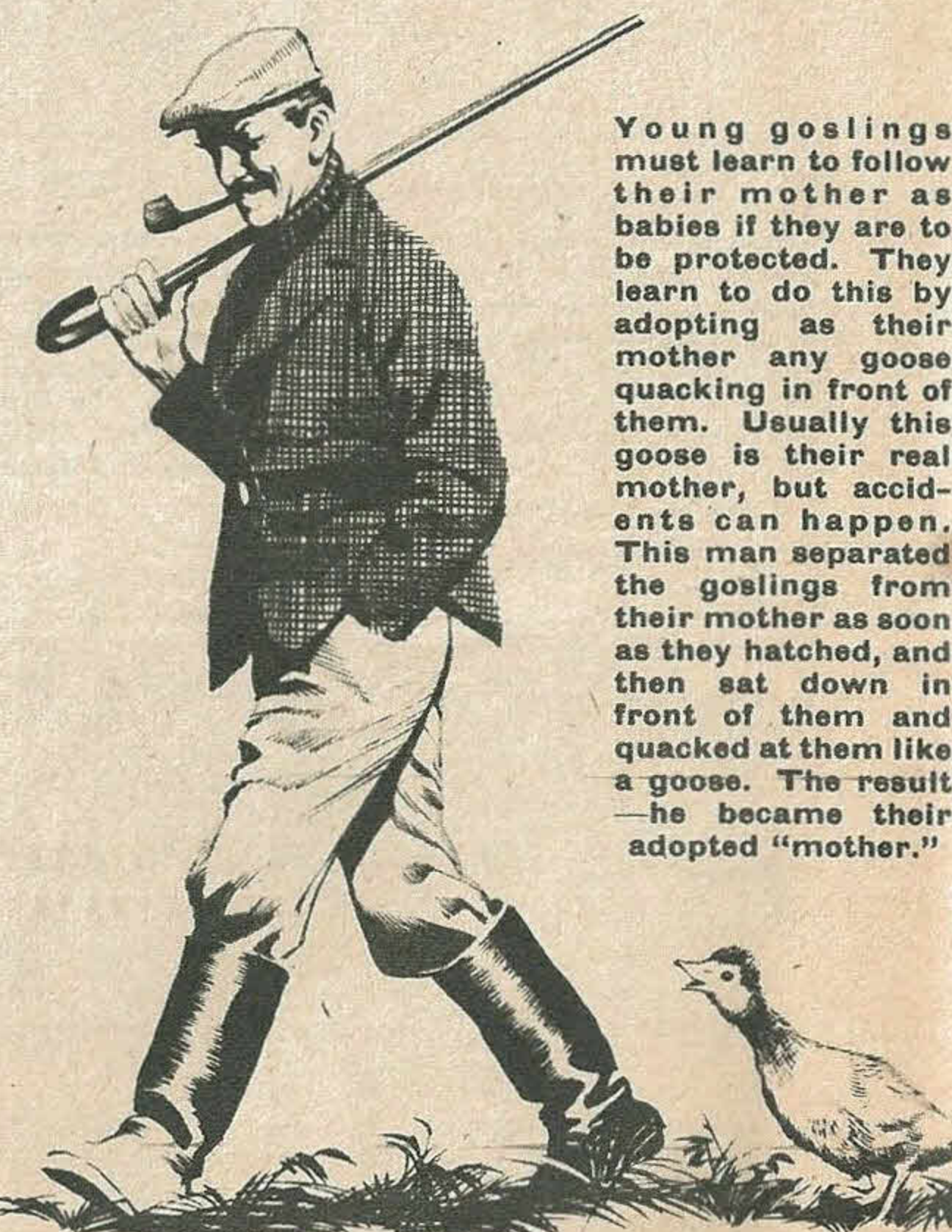
This pattern of behaviour has been inherited from the robin's parents, and the main value of the pattern is that it helps the robin to survive. Although not all the things animals do are instinctive, all the actions that animals must make if they are to survive are inherited and instinctive.

You can see the advantage of having a built-in reaction to a situation: it saves time. Often a young animal does not have time to learn how to fend for itself before it gets eaten by another animal.

The young robin, for instance, is much too weak



This mother hedge sparrow has unwittingly reared a baby cuckoo that is already twice her own size. Her own young were thrown out of the nest by the cuckoo when it was born. By continually opening its yellow beak and demanding food, the cuckoo ensures that its foster parent brings it enough to eat.



Young goslings must learn to follow their mother as babies if they are to be protected. They learn to do this by adopting as their mother any goose quacking in front of them. Usually this goose is their real mother, but accidents can happen. This man separated the goslings from their mother as soon as they hatched, and then sat down in front of them and quacked at them like a goose. The result—he became their adopted "mother."

If you have a pet of your own, you will especially enjoy this fascinating new series....

THINK ABOUT?



A high speed camera has caught this mother robin in action, pushing food down the wide open beak of its hungry offspring. The baby robin's brother looks on anxiously, ready for his turn.

and unprotected to fend for itself. So it instinctively opens its beak wide in a gaping fashion, and nature has provided that the parents should respond to this in an instinctive way by pushing food into the beak.

The young chick is not fed by the mother hen, so it instinctively pecks anything about pebble-size that it sees on the ground. Some of the things it pecks will be food, and so the chick survives. Later the chick learns which things are never good to eat, and it learns to avoid them. But instinctive pecking ensures meanwhile that it does not starve to death.

Many animals are born with an instinctive reaction to danger. Young herring gulls, for example, instinctively show alarm when they see a hawk flying overhead, even though they have never seen a hawk before in their lives. Thus their instinct makes sure that they don't have to learn by bitter experience that hawks like eating young gulls.

The price animals have to pay for having these built-in reactions that protect them from danger is that they are unable to adapt themselves to new situations when something goes wrong.

And the fact that things can go very wrong when an animal acts instinctively only demon-

strates how blind instincts are, and how little understanding the animal really has.

Take the young robin in his nest, for example. If the young robin fails to open his beak wide for any reason, his parents will simply ignore him, even though he is sitting as plain as plain in front of their eyes. They are quite capable of watching their own baby starve to death.

Learning the Signs

TAKE the motherly hen as she fusses over her chicks. She will chase after them when they disappear cheeping round the corner of the barn. But if the chicks are placed in a glass sound-proof cage so that the hen can see them but not hear them, the hen will simply forget about them and go off and feed. She will even see them being attacked in front of her own eyes, and do nothing—she can get as silly as that.

These examples of instincts that go wrong also tell us something about how they work. The robins only feed their young if the young gape open their beaks. The gaping beak somehow triggers off the feeding behaviour, so that if the parents do not see the beak, they simply stop feeding the young.

Similarly what triggered off the hen's mothering instinct was the *sound* of her chicks, not the sight of them. As soon as they were put out of earshot in the glass cage, they were out of her mind.

This is very different from really intelligent behaviour, because if the hen really understood what she was doing she would be able to react properly and try to get her chick out of the glass cage.

These simple signs that trigger off an instinctive act are called "releasers" by biologists. It is only by learning to read these signs that we can begin to enter in to the animals' world.

One German naturalist called Konrad Lorenz had great fun with the releaser that makes young geese follow their mother about.

He decided that the releaser was the mother's quacking. To test his theory he started quacking in front of some newly-hatched goslings. After half a day of this, all the goslings started following him about. Clearly he was their "mother." From that day on, they never looked at another goose, and Lorenz had a brood of loving, if difficult and tiring children!

If animals have instincts, do we? The answer is that we do, but that we are much less dependent on them. Most of them are simply emotional reactions that we are unable to control.

Have you ever been to a 3-D film, for instance, when a knife is thrown straight at the audience, and everyone instinctively ducks? Or have you been with a group of frightened people, and become frightened, too, in spite of yourself? Fear of the unknown spreads quickly, and is quite instinctive.



NEXT WEEK: THE PIG THAT WORKED A SLOT MACHINE

FROM THEN TILL NOW

ALL THE FUN OF THE FAIR

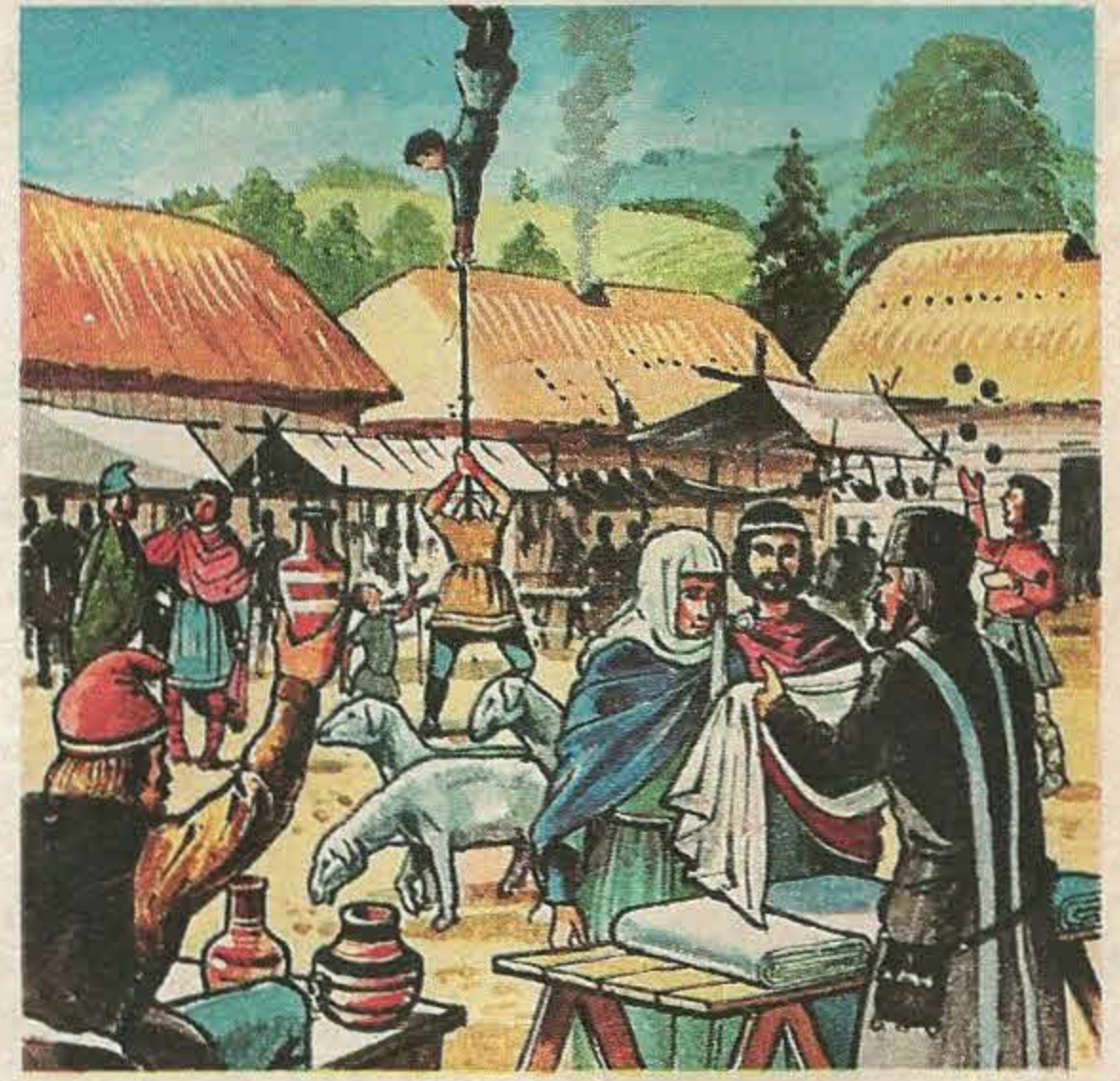
part one



Originally a fair was a gathering of people who met to trade, seek amusement and take part in religious ceremonies. This is a section of a drawing of an old Mexican fair, showing market stalls and traders with their pottery and basketware.



The Romans held carnivals, or fair days, which included the procession of captured wild animals from all parts of the empire. Later these animals were loosed in an arena to fight to death. Gladiators also fought to amuse the crowds.



This is an Anglo-Saxon fair, where traders sold fabrics, jewellery and pottery from their tables. Livestock was also sold, and there were jugglers, acrobats, like this pole-balancing act, and musicians. The fair would be held in a village.



After the Norman conquest of England, trade with foreign merchants grew. In medieval times the right to hold a fair became a special privilege, given in the form of a Charter. These fairs were held on saints' days, like the St. Valentine Fair at King's Lynn, Norfolk, chartered in 1204. This is a typical medieval fair, with dancing bears, cock-fighting, stalls, jugglers, players and livestock.



Sport was an important part of fairs in the robust Tudor age. Wrestling and archery were popular, and small boys let loose wild rabbits which they chased among crowds. There was a maypole, music, dancing, eating and drinking on the village green. "Pleasure" fairs, at which no trading was done, soon became popular, like the Bartholomew Fair held in London.



The great "frost-fairs" of the seventeenth century were held on the frozen River Thames, which provided an unusually large fairground. Traders sold hot drinks and food to the crowds, for the ice was so thick that fires could be lit upon it.



This small-town fair of the eighteenth century has new amusements. There is a peep-show (right) and an early version of the "big wheel," rope-sliding from the church tower and animal fights. Deformed creatures were also on show.

LOOK AND LEARN



FOCUS

LEST WE FORGET

*November 10 is
Remembrance Sunday*



Poppies grew in the fields of Flanders where the battles raged in the First World War, and the poppy has since become an emblem of Remembrance. Those sold on Remembrance Sunday are made in the British Legion's factory by disabled ex-servicemen, and last year over a million pounds was collected for ex-Service and other charities. This girl is in the Garden of Remembrance outside Westminster Abbey, where poppies are placed on small crosses.



FROM the clock tower of the Palace of Westminster the deep sonorous note of Big Ben boomed out over the night sky of London.

The time was eleven o'clock on August 4, 1914, and as the last stroke died away, another sound was heard—cheering and shouting, growing in volume as crowds of people began to choke the streets, surging towards Buckingham Palace. Soon the whole area in front of the Palace was a sea of wildly excited Londoners, throwing their hats in the air.

Why were they cheering? What was the good news heralded by the chimes of Big Ben?

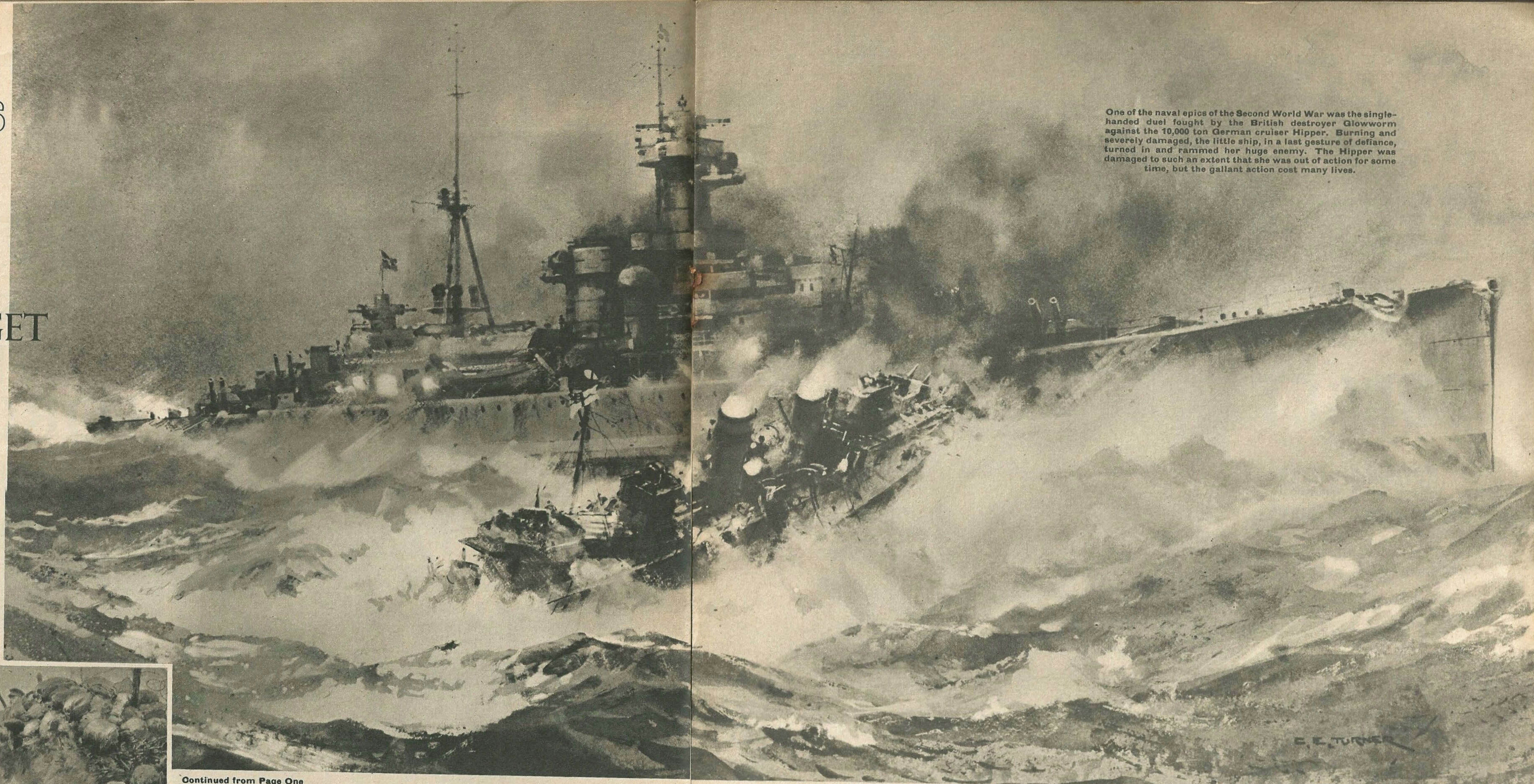
The good news was that we were at war with Germany.

Just over four years later, as the morning sun tried to pierce the November fog, Big Ben was again chiming eleven o'clock and again

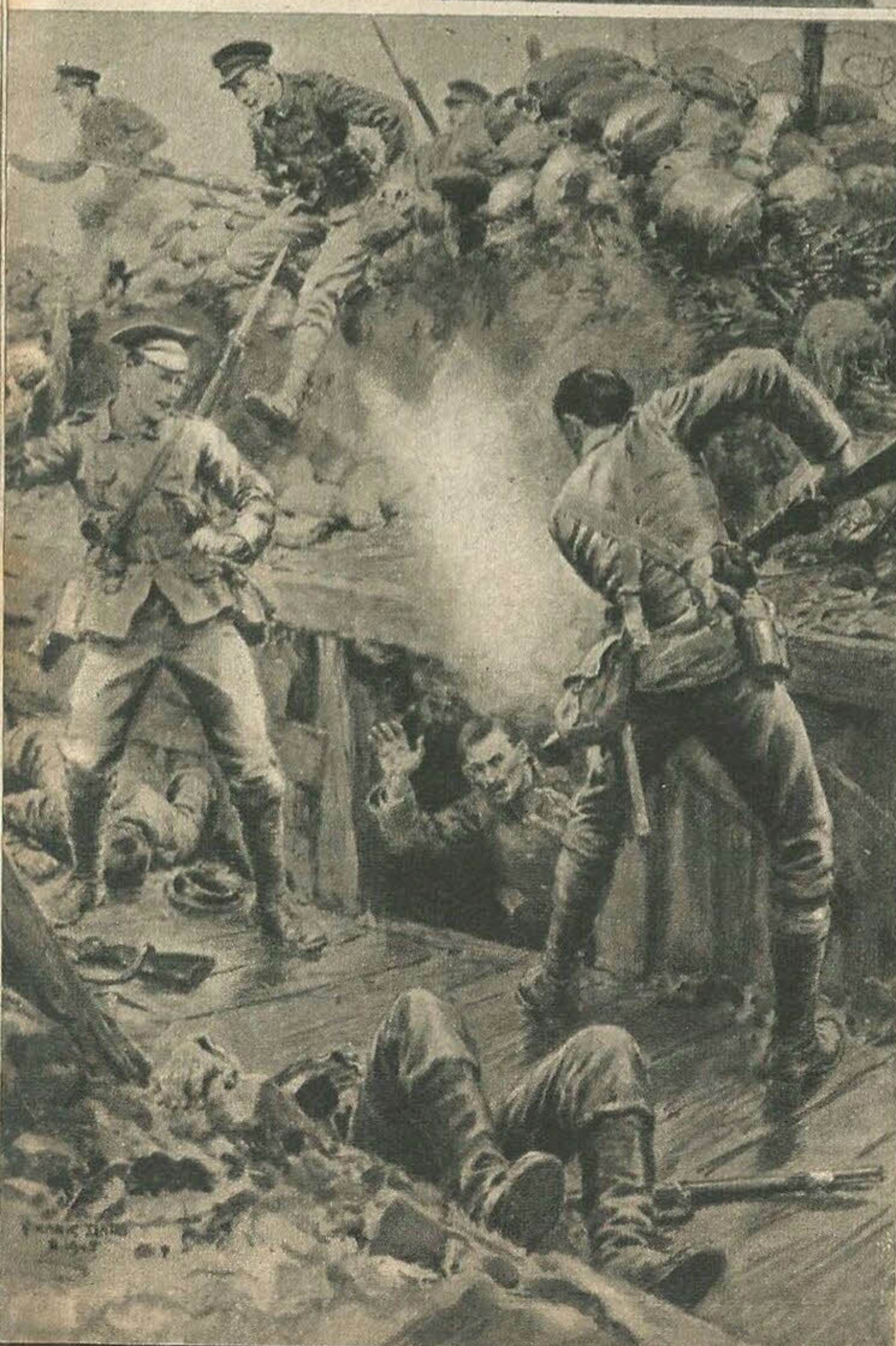
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LEST WE FORGET

November 10 is Remembrance Sunday



One of the naval epics of the Second World War was the single-handed duel fought by the British destroyer Glowworm against the 10,000 ton German cruiser Hipper. Burning and severely damaged, the little ship, in a last gesture of defiance, turned in and rammed her huge enemy. The Hipper was damaged to such an extent that she was out of action for some time, but the gallant action cost many lives.



Continued from Page One

the cheering broke out as people streamed from houses, shops and offices to march in gay parade, arm in arm, in celebration.

What was the good news this time? That the war with Germany was over and that she was a defeated, broken nation.

Here and there in the crowd were people who did not laugh and cheer. They were the relatives of the men who had been killed in battle. But this, of course, had been "the war to end war." Now the nations on both sides must get together and ensure that all future differences were settled around the conference table. A League of Nations! If it really meant an end to war, then even the loss of all those lives might have been worthwhile. That was the hope when the Peace Treaty was finally signed in the Hall of Mirrors at the Palace of Versailles in 1919.

The moment of real courage in the First World War came when the men clambered out of their trenches and went "over the top" in a hail of shot and shell. Many never reached the enemy lines—but this party did, and found the Germans sheltering in their dug-outs.

Sphere and Graphic

But twenty years later, on a Sunday morning in September 1939, Big Ben tolled again to herald another war with Germany which, as it developed, was in many ways so uncannily similar to the first that it seemed as though the world had gone mad. In the first war the German figurehead was arrogant, spiky-moustached Kaiser Wilhelm, heading a great Prussian vision of power which would come to Germany if she were strongly armed, bold, and ruthless.

In the second conflict it was the toothbrush-moustached Hitler, leader of the Nazis, blinded by visions of greatness and seeing himself as head of a Germany dominant in Europe.

Both men caused Europe years of anxiety as they built up their military might, a Europe not wanting war and reluctant to arm, but bound, when the time came, to fight aggression even if ill prepared for it.

The breaking point, in both cases, was invasion of territory by the Germans. In 1914 it was Belgium; in 1939 it was Poland.

In both instances Britain issued an ultimatum-demanding evacuation of the territory, which was ignored, so that war had to follow.

In 1914 and in 1939 the outbreak of hostilities meant British troops crossing to France—a puny force, ill-equipped for the type of warfare which

Illustrated London News

was to follow, and unprepared for its new tactics.

At sea, both wars were fought not so much on the surface, but under it. The German U-boats moved into the Atlantic, preying on the merchant vessels which were bringing food and supplies from the New World. They scored such a success in the first war that there was a time when Britain had only a fortnight's food in her larders. In the second war the Atlantic was the graveyard of thousands of ships trying to sustain the lifeline between Britain and the American continent.

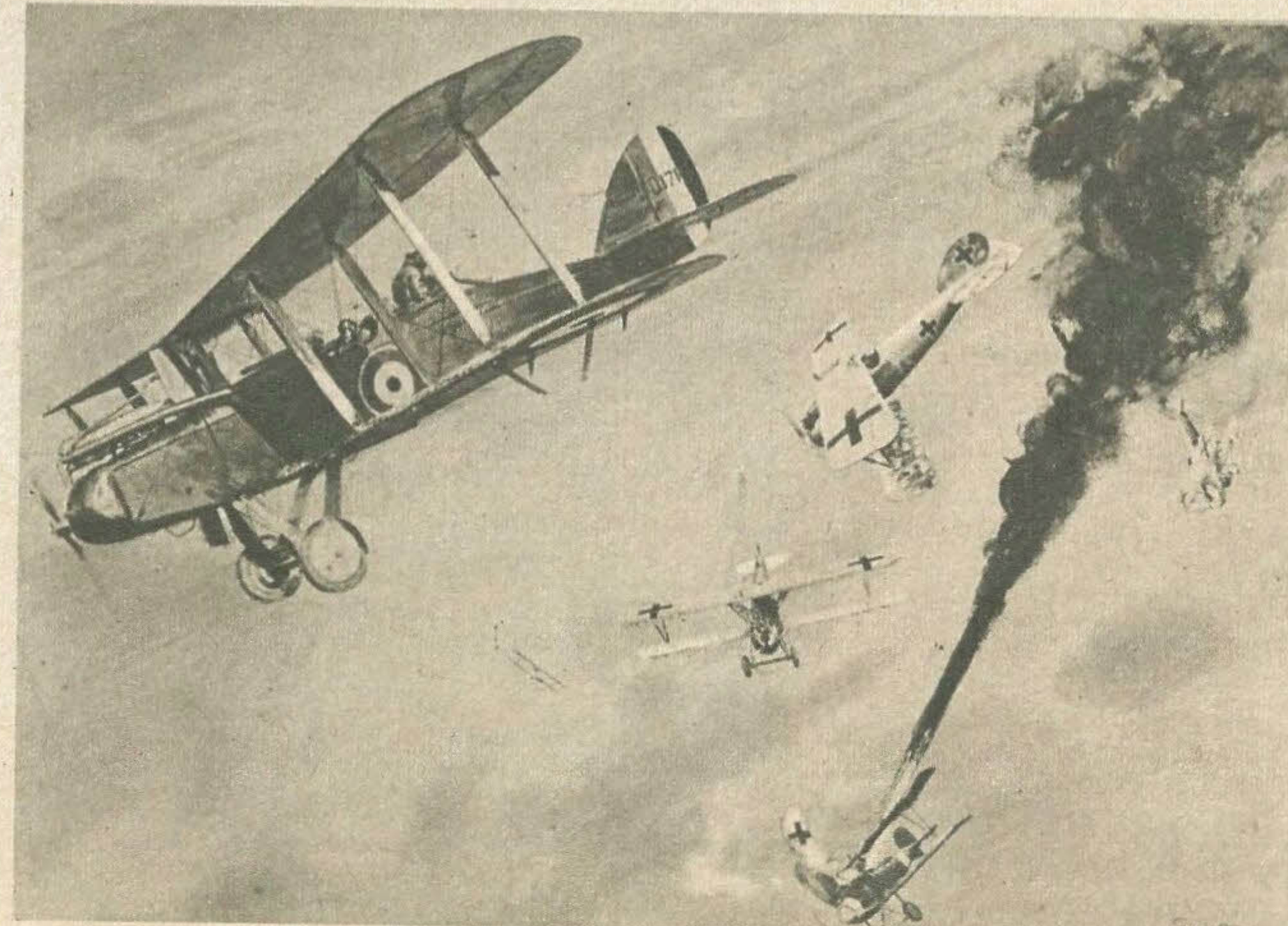
And America herself? In both cases she stayed out of the European conflict at first, then finally brought her military might to the aid of those fighting the Germans.

In both wars, British homes were in the conflict, shattered by bombs from the skies. In the first war the raiders were Taubes, bird-like aeroplanes which took London completely by surprise, and Zeppelins, giant gasbags which cruised over our cities in the glare of the search-lights, dropping their bombs indiscriminately over residential areas.

In the second war the sky was darkened by clouds of Dorniers and Heinkels with instructions to lay our cities in ruins.

Most tragic of all comparisons between the

CONTINUED ON PAGE SIX



The air itself had hardly been conquered when the first warplanes went into battle. Many "dog fights" took place and here British D.H.9s are in conflict with German Albatross machines.

Imperial War Museum

LOOK AND LEARN

FOCUS

**LEST
WE
FORGET**

**November 10 is
Remembrance Sunday**

‘Do not let us speak of darker days; let us speak rather of sterner days. These are not dark days; these are great days—the greatest days our country has ever lived; and we must all thank God that we have been allowed, each of us according to our stations, to play a part in making these days memorable in the history of our race.’

—WINSTON CHURCHILL, in a speech to the boys of Harrow School, October 29, 1941

*THE SPITFIRE
Reproduced by kind permission
of the artist, Peter Scott*



two wars was the fact that Britain and her allies entered the conflict with out-of-date military textbooks, so far as the war on land was concerned. We began in the First World War almost as though no military development had taken place since the Boer War at the turn of the century. It developed into a grim and bloody battle of the trenches.

World War Two began with the greatest trench defences the world had ever seen—the heavily fortified French Maginot line, which hardly fired a shot because the German motorized forces drove through the gap between it and the coast.

In both wars Britain found a great and inspiring leader who shortly afterwards found himself in the political wilderness—Lloyd George in the first conflict, and Winston Churchill in the second.

As the first war ended with the League of Nations, determined to settle all differences over the conference table, so did the second war end in the United Nations, with the same avowal that words would take the place of gunfire.

These were the similarities. What were the differences?

In the second war the British forces were driven from France, unable to challenge Germany until she had, with the aid of her Allies, including the mighty United States, built up such a force that its power would drive the Germans back to Berlin itself.

Over The Top

BUT in the first war the Allies were locked in conflict with the Germans for over four years, in a holocaust of mud and blood and a sacrifice of life that still stuns the imagination.

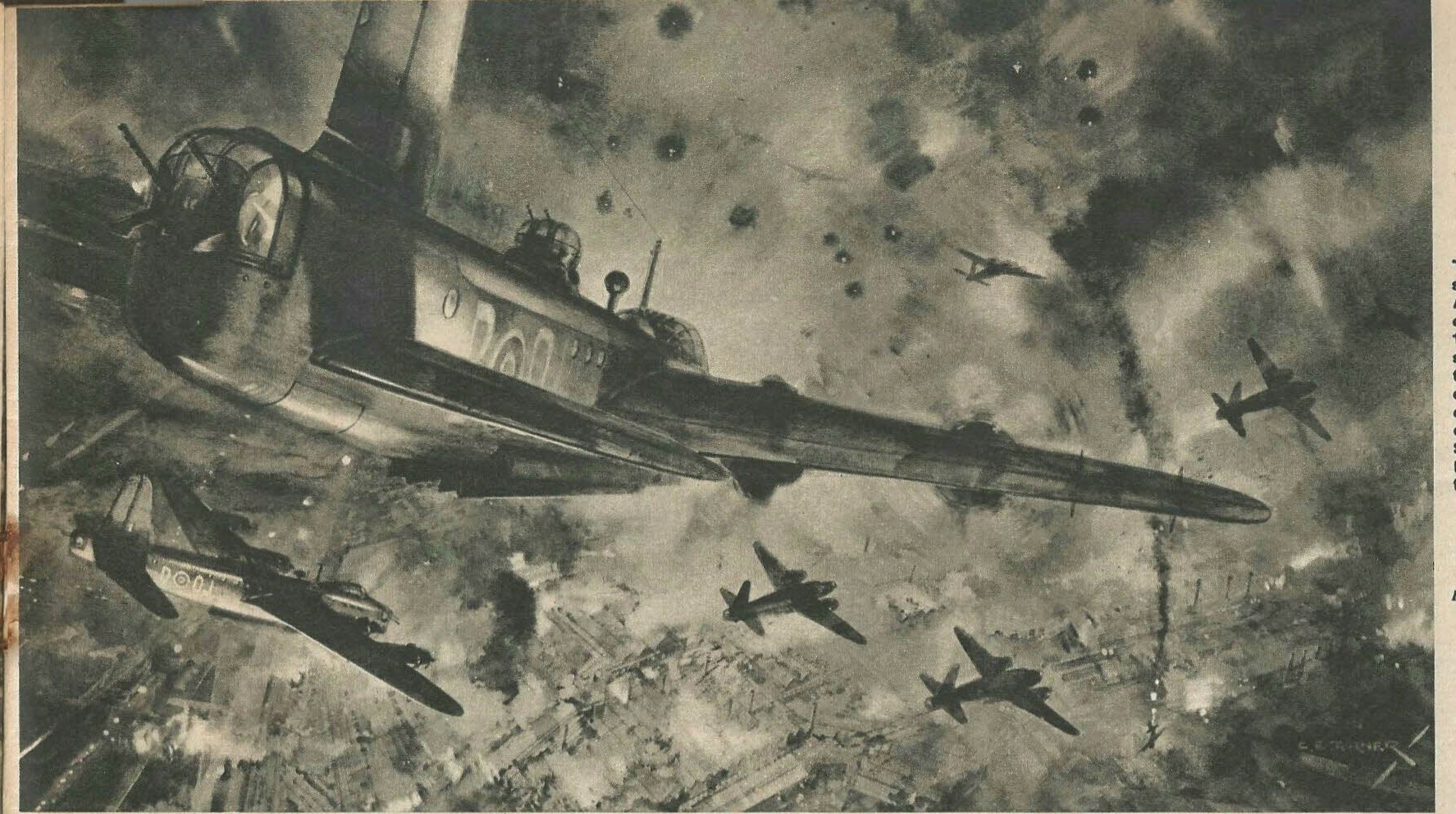
The Germans had been halted almost at the gates of Paris and driven back. The tide of war ebbed and flowed across miles of countryside until every tree, every blade of grass, had been blasted out of existence, leaving only a skyline of naked earth and barbed wire, to be churned up over and over again by shell fire so that even the bodies of the dead were not to be left in peace.

The soldiers lived their lives in the trenches, dug deep in the earth, lined with timber and provided with duck-boards to walk on so that they did not sink into the mud. Deeper than the trenches were the "dug-outs" where they ate and tried to sleep even though, as often happened, the seeping water was ankle deep.

They watched and waited. Perhaps a nightmare barrage would herald a German attack from trenches no more than a few yards away. Sometimes at night they crept over the top and went on patrol, cutting stealthily through the barbed wire and wriggling on their stomachs on the muddy earth towards the enemy, trying to find out what he was up to; their hearts in their mouths, wondering when a burst of machine-gun fire would mow them down. The utter darkness might be destroyed by the sudden glare of a star shell, showing them up in a stark blue light.

Then they might hear about a Great Offensive which, in simple terms, meant that at a given moment they would climb the parapets, go "over the top" and advance through murderous fire towards the enemy lines.

CONTINUED ON PAGE EIGHT



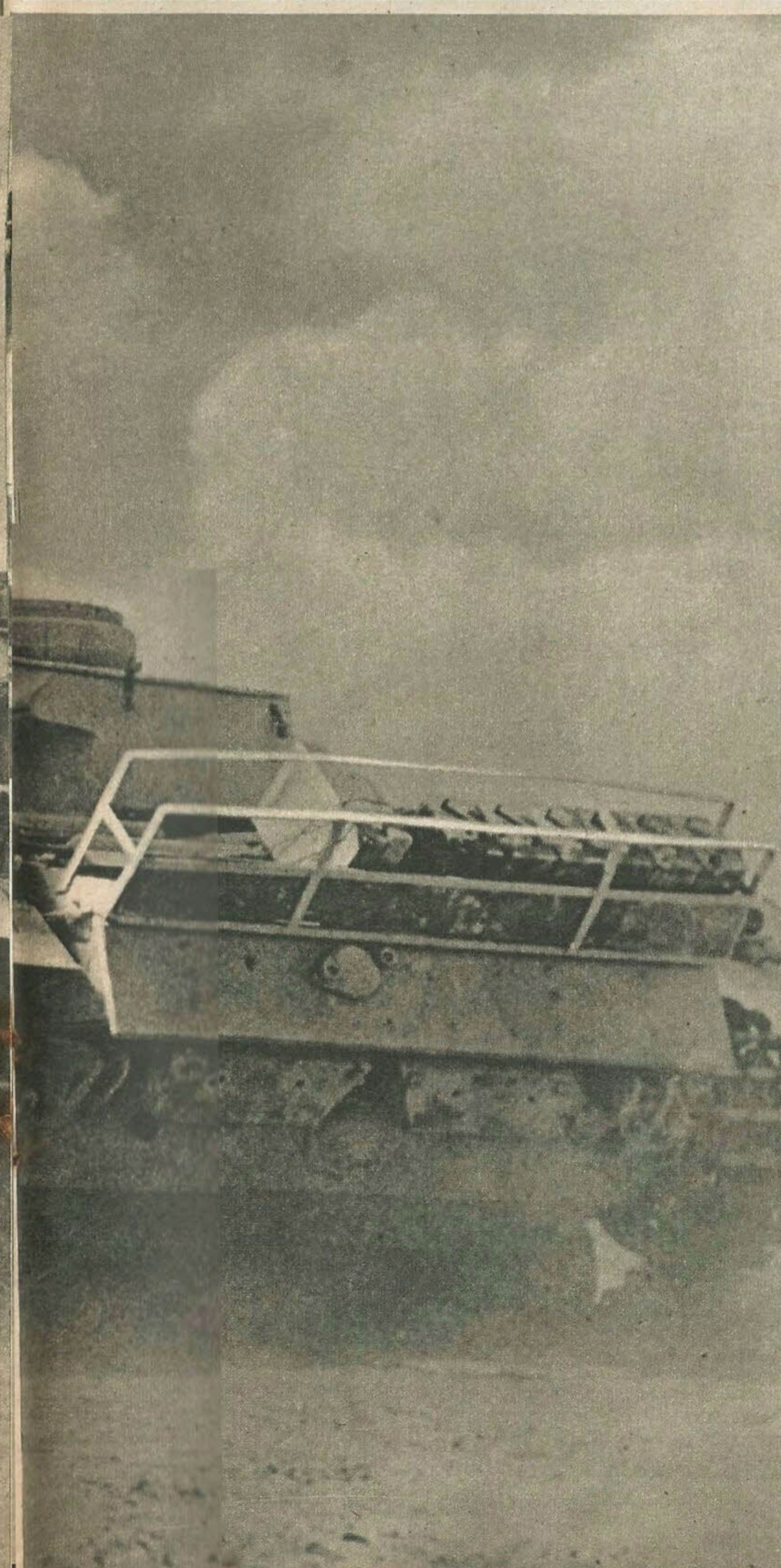
The growing air strength of the Allies was demonstrated in 1942 when, in one single night, a thousand bombers raided the industrial districts of the Ruhr. Here Stirling bombers have dropped flares to illuminate the target.

Illustrated London News

In the Western Desert the fortunes of war ebbed and flowed between both sides. It was a war largely fought by the tanks, the "ships of the desert." The camera catches a moment when the crew of an enemy tank surrenders to British troops.



Imperial War Museum



Illustrated London News

When Norway was invaded by the Nazis in 1940, Allied forces launched an attack at Narvik in the hope of establishing a foothold. The destroyer Hardy led the way, but was hit and ran aground. But the men, determined to land, plunged into the icy water and swam ashore. The whole force, under Admiral Whitworth, launched a surprise attack against the Germans. But lack of air support doomed the whole venture to ultimate failure.

FOCUS

LEST WE FORGET

*November 10 is
Remembrance Sunday*

In the Second World War the struggle was not only on distant battlefields—it was brought right home to the people of Britain. Explosives and fire bombs laid many cities in ruins, in spite of the fearless efforts of Civil Defence workers.

Continued from Page Six

Eight hundred thousand men from the United Kingdom who went into battle thinking that the outcome might bring them nearer peace, never lived to make the homeward journey.

That is why, when you go to some parts of France and Belgium today you find that, nearly half a century afterwards, it seems haunted by those lost legions—not only in the quiet and peaceful cemeteries, but in towns like Ypres, still with the cobbled streets where war-weary soldiers rested their bodies, and where a great archway memorial spans the Menin Road, down which so many of them marched back to the trenches, the road of no return.

The Second World War lasted longer, but mercifully cost us the lives of fewer men (244,000) although to this must be added the 60,000 civilians who were victims of the air raids.

And at the end? The avowal "never again"—and indeed there never will be a conflict of that kind again, for none of us can escape the knowledge that the world is stockpiled with atomic weapons of destructive power which is beyond our imagination.

The danger of this is receding as the great Powers move towards an understanding—and if they succeed, then the horror of war will at last have been banished from the Earth.

But on Sunday morning, November 10, at eleven o'clock, you will be asked to remember those of your countrymen to whom the sacrifice of their life was the only way they knew of saving their land from aggression.

We know the full truth—that both wars might have been avoided, that politicians might have preserved peace, that military commanders blundered, that war is never the real answer. We know the folly of investing war with glamour; and we know that, human nature being what it is, war is sometimes more stimulating and exciting than peace.

But we have learned the hard way, and the peace we enjoy today has been bought at a tremendous price. We must remember those who paid the price.

Lest we forget.

PAGE EIGHT



Above: For many children of Britain the Second World War meant separation from their homes, for they were evacuated to safer places in the country. Below: One of the many war cemeteries now standing where the battle raged. Soldiers of two World Wars are now at rest on foreign soil.



PUTTING IT ON THE MAP

IT took two thousand years for the course of the White Nile to be accurately charted from its source in East Africa to its mouth in Egypt. Today this charting could probably be done in a few weeks. The explanation for this is the reconnaissance plane. Photographic work from planes began during World War I, when the positions of enemy troops had to be watched. The modern equivalent of the military reconnaissance plane of 1914 is the U-2, America's high-flying spy plane that takes infra-red photos of military installations from heights of several miles above the ground.

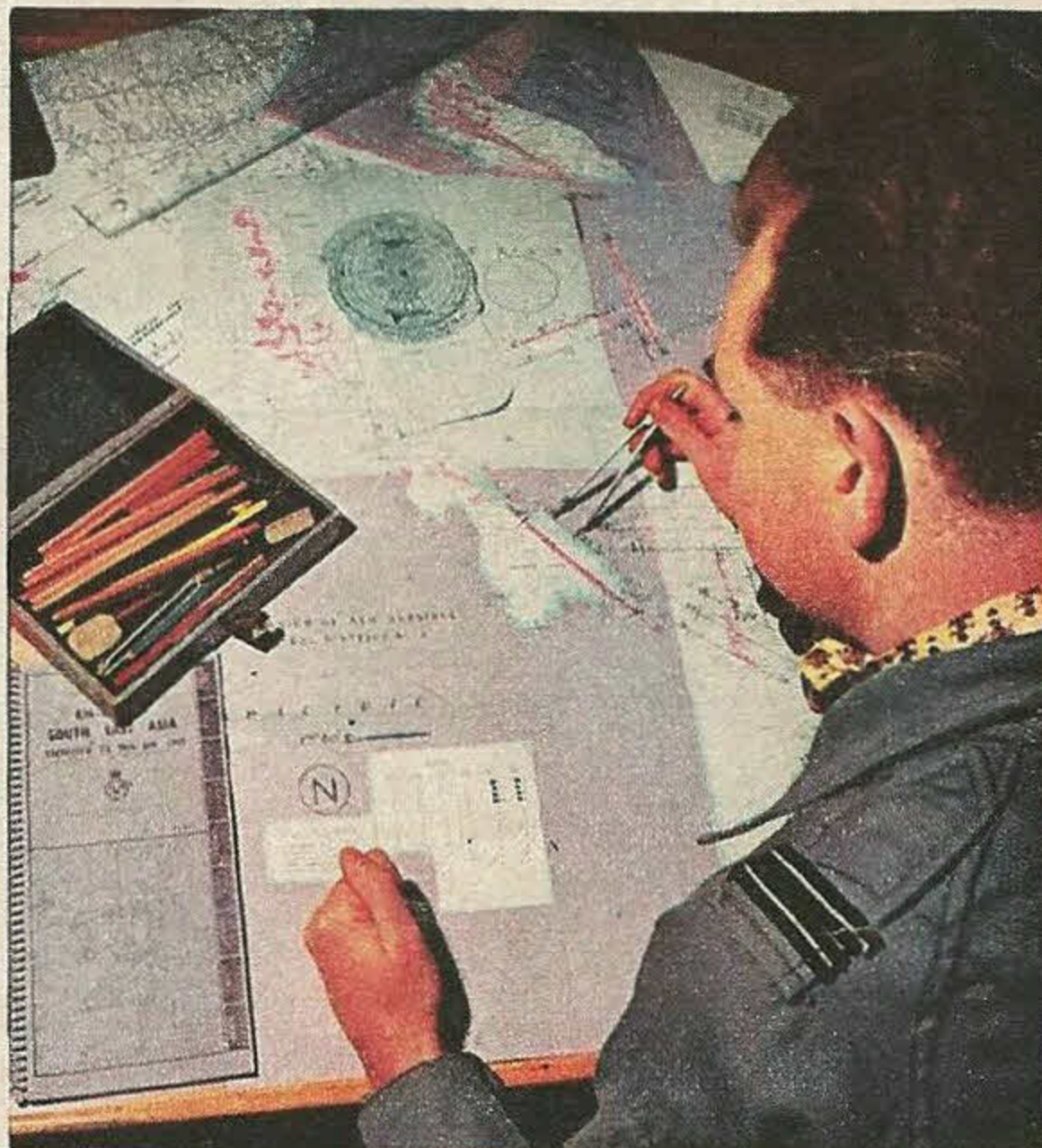
A more everyday use for the reconnaissance plane is that of making new and more detailed maps of uncharted land. In map-making, the taking of photographs is only the beginning of the story. At the Directorate of Overseas Surveys in Tolworth, the details from the photos can be used to trace the course of every river or road, the contours of a mountain, or the limits of a forest. Several hundred photos, overlapping each other, are needed to make one single map.



An R.A.F. navigator receives detailed instructions about his flight course. Briefing is done by a survey officer of the Royal Engineers who works under Survey authorities.



The survey cameras take one photo every twenty-five seconds. As the plane flies at about 500 m.p.h., there is a 60 per cent overlap between two successive photos. Thus each area is covered twice.



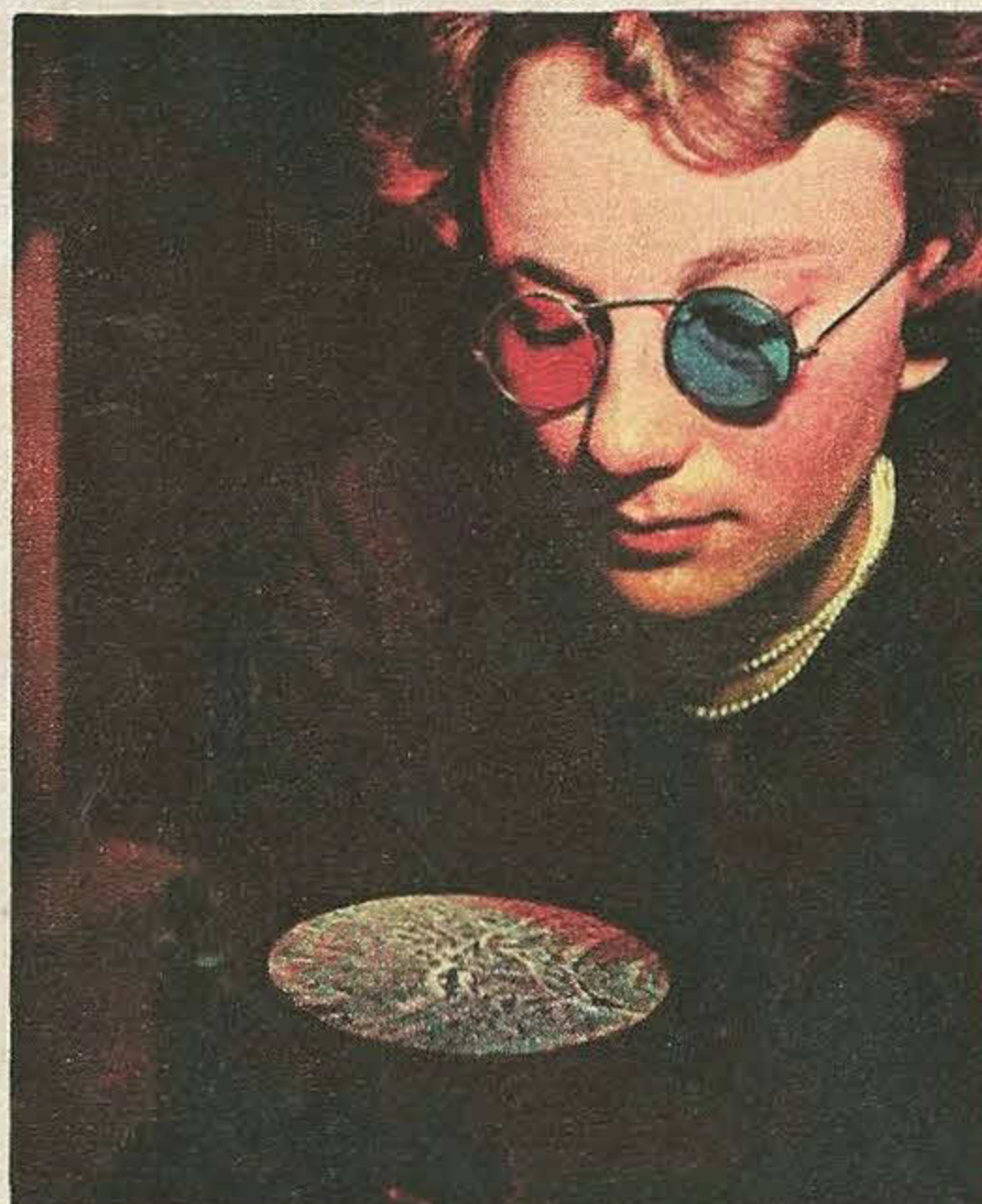
On the ground, the plane's course is mapped out. The aircraft carries up to nine cameras, and 4,435 square miles can be covered in one flight. If the same area had to be charted on foot it would take several months.



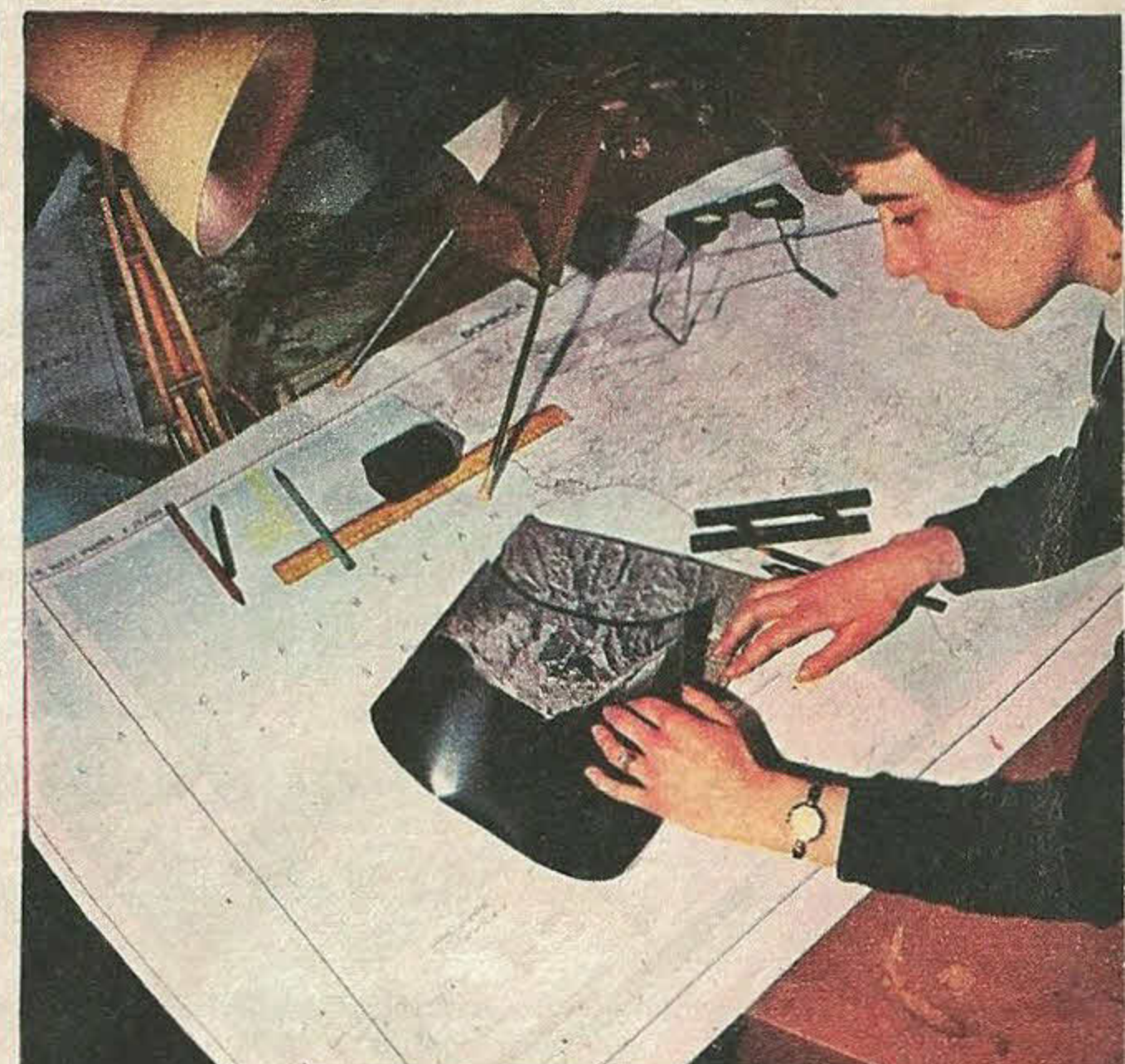
When the photos arrive at the Directorate, the important landmarks, such as hills and rivers, are carefully marked. These positions are then transferred to plastic plates (called "templates") and are marked by a series of pinpricks and holes.



The templates are carefully pinned together so that they make a perfect mosaic of the area. The correct position of each pinprick is measured off, and all the positions are transferred on to the map which is being made of the area. The overlap of the photos allows landmarks to be double-checked.



In order to plot the heights of mountains and hills, any two of the overlapping pictures can be used as a "stereoscopic pair." Placed in a stereoscope, they show the area in 3-D, and from this the heights can be calculated.



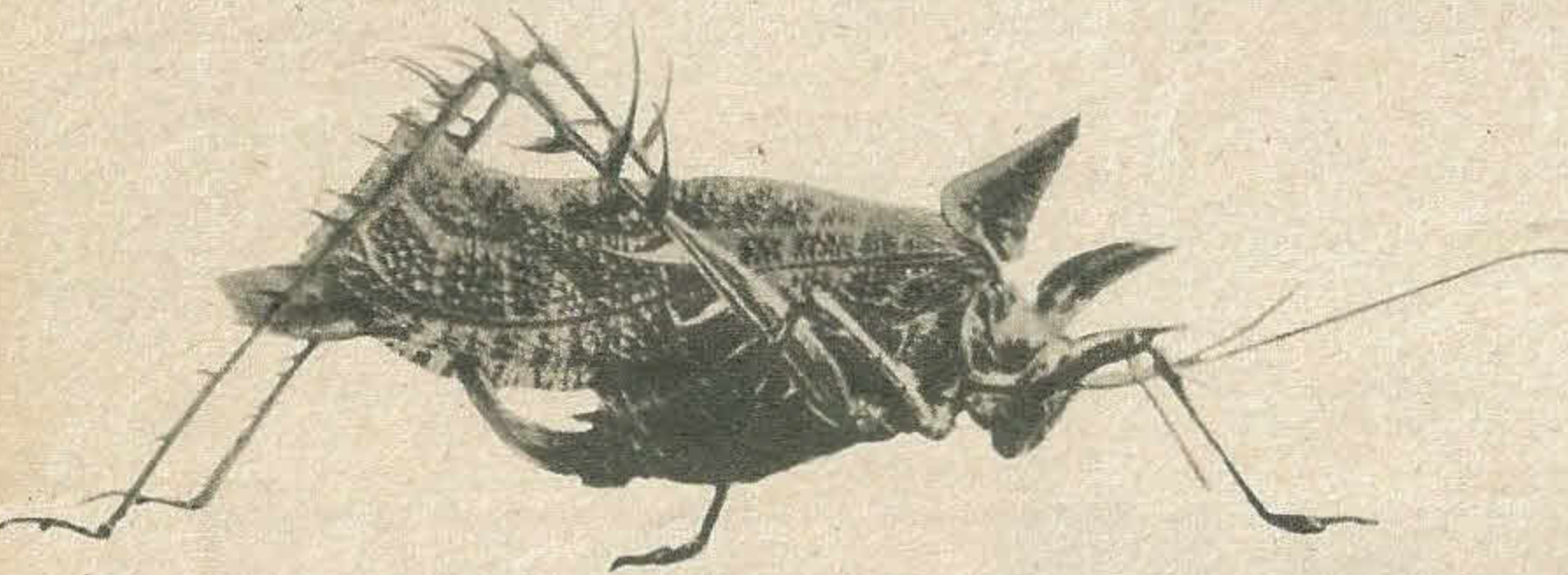
Finally a detailed comparison is made between the many hundreds of photographs of the area and the new map. The map now contains an accurate and exceedingly detailed record of all that is in the area in a fraction of the time taken by a survey on foot.

Did You Know That...?

... the hollows in the crown of the Statue of Liberty overlooking New York harbour are big enough for people to stand in. Visitors take a lift to the statue's crown, and from this vantage point they have a magnificent view of the harbour. The 305-foot-high statue (and pedestal) which stands on Bedloe's Island, was designed by Bartholdi, and was presented to the United States by the French Government in 1884.



... the grasshopper is one of the commonest insects of the countryside. The chirping noise it makes is caused either when it rubs its hind legs against the hard veins of its front wings, or when it rubs the bases of its front wings together. The grasshopper shown in our picture is a South American species.



... the rainbow is really part of a circle. How much of the circle you see depends on the position of the sun. For example, if the sun is high in the sky, the rainbow will be very low. If you reach a high vantage point, such as a mountain top, it is possible that you will be able to see the complete rainbow circle. The rainbow is made up of all seven colours of the spectrum.



... in ancient China and the South Sea Islands people once used cowrie shells for money and carried them around their necks in the form of a necklace. One of the earliest known forms of money was the Babylonian clay tablet, used about 4,000 years ago.

Mystery



WHO IS THIS? (Answer below)

Picture

GREAT BEGINNINGS

HE

LIFTED A CANAL OVER A MOUNTAIN

This was one of the early engineering triumphs of John Rennie, the village boy who was later to give London some of her finest bridges and greatest docks

IN the late 1760s a boy lay face down on the river bank and watched the Tyne in spate. The East Lothian countryside was bright with Autumn, and the river, a golden-brown torrent, carried flotsam of leaves and twigs on its broad surface.

It would be fine, he thought, to make a fleet of toy boats and sail them on the racing water. He scrambled to his feet. Andrew Meikle the builder of windmills would let him use his tools, and he could have at least one boat ready to play with after school tomorrow.

Andrew was away from home, building a corn-mill, but the door of the workshop at Houston Mill was open. The dim, cluttered interior was familiar ground to ten year-old John Rennie, for he and the millwright were old friends.

Born Engineer

FOR a time he whittled at the piece of wood he had brought with him, but found the tools too big to make the tiny craft he had in mind.

But John Rennie was not to be beaten. Off he wandered, through the stubble fields, to the forge of the blacksmith.

"Willie, could I have a loan of your hammer to make some wee tools for myself?" he asked.

The big man grinned down at him, for they were also old friends.

"Laddie, ye couldna' handle it. But there's a lighter one you could have, and I'll blow up the fire for ye."

Soon a small figure was busy in a corner of the workshop. John was making a good job of his first boat, and a miniature set of tools of his own forging lay ready to hand.

The boy was a born engineer, and when he had finished with the village school at the age of twelve he started an apprenticeship to Andrew Meikle, following that with study at Dunbar High School. He was soon far ahead of his fellow-pupils, and when his mathematics teacher went to another post, John took his place.

It was a feather in his cap, but he was determined to enter Edinburgh University. There he studied chemistry and natural history, and worked as a millwright during the vacation to earn money for his fees.

After three years he went to England, to see for himself some of the engineering wonders of the Industrial Age. On his journey south he visited the famous James Watt at Soho, on the outskirts of Birmingham.

New Docks

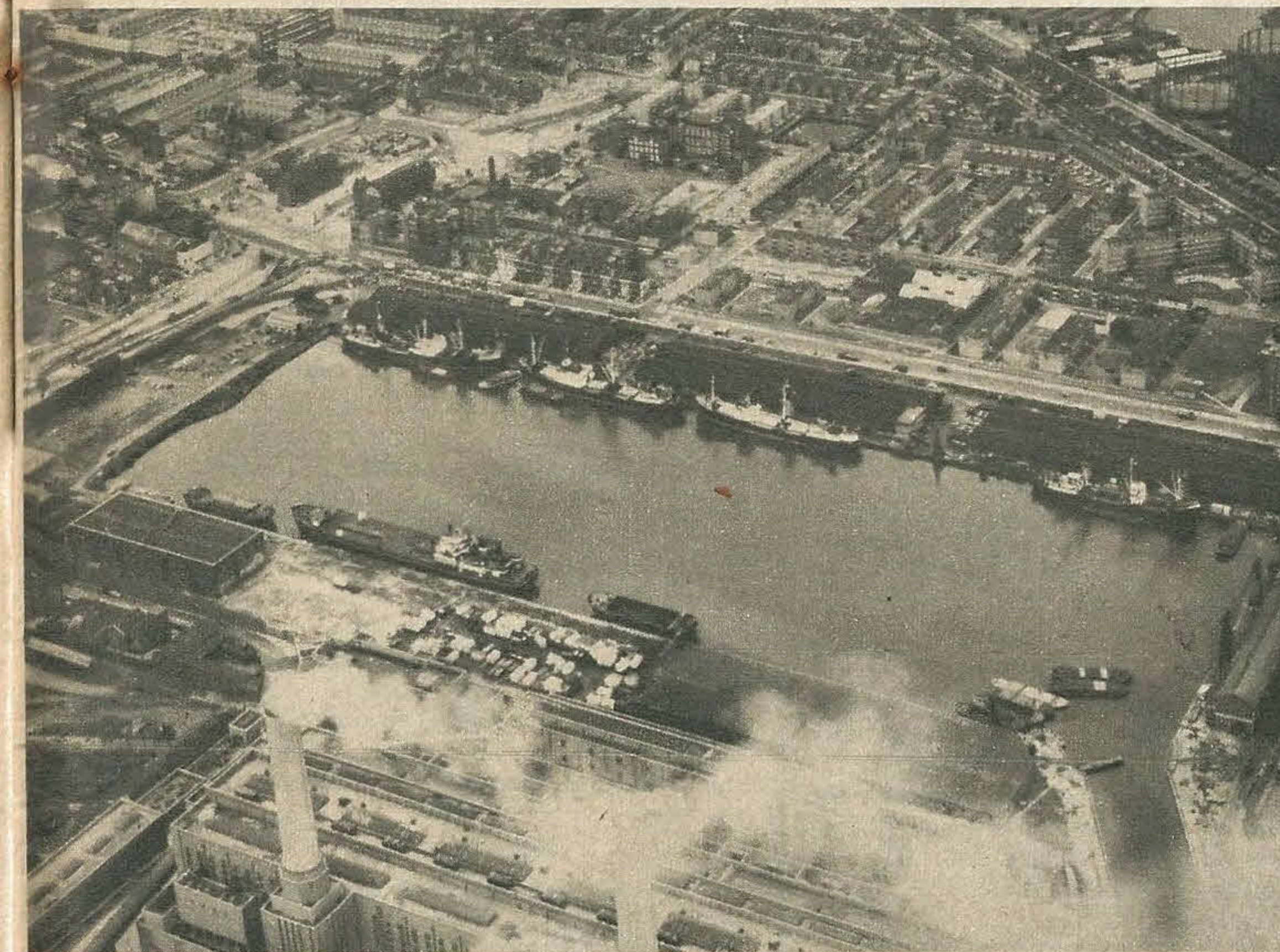
THE outcome of their meeting was that he was engaged by the firm of Boulton and Watt, and given the task of designing machinery for the new Albion Flour Mills in London, which was to be driven by steam.

It was an important commission, and John Rennie made history in the way he handled it, for he used iron instead of wood for framing and shafting the machinery and for wheel parts.

Not surprisingly, Rennie's reputation soared, and when he started business on his own account he had no lack of clients, especially for mill machinery. But by the time he was thirty he was able to tackle much greater things.

This was the beginning of a lifetime of engineering projects. When he built the Rochdale Canal, which was to give direct communication between the manufacturing districts of West Yorkshire and South Lancashire, Rennie actually had to "lift" the waterway over the great mountain spine of England in a series of locks, a revolutionary idea in those days.

One day Rennie was asked to attend a

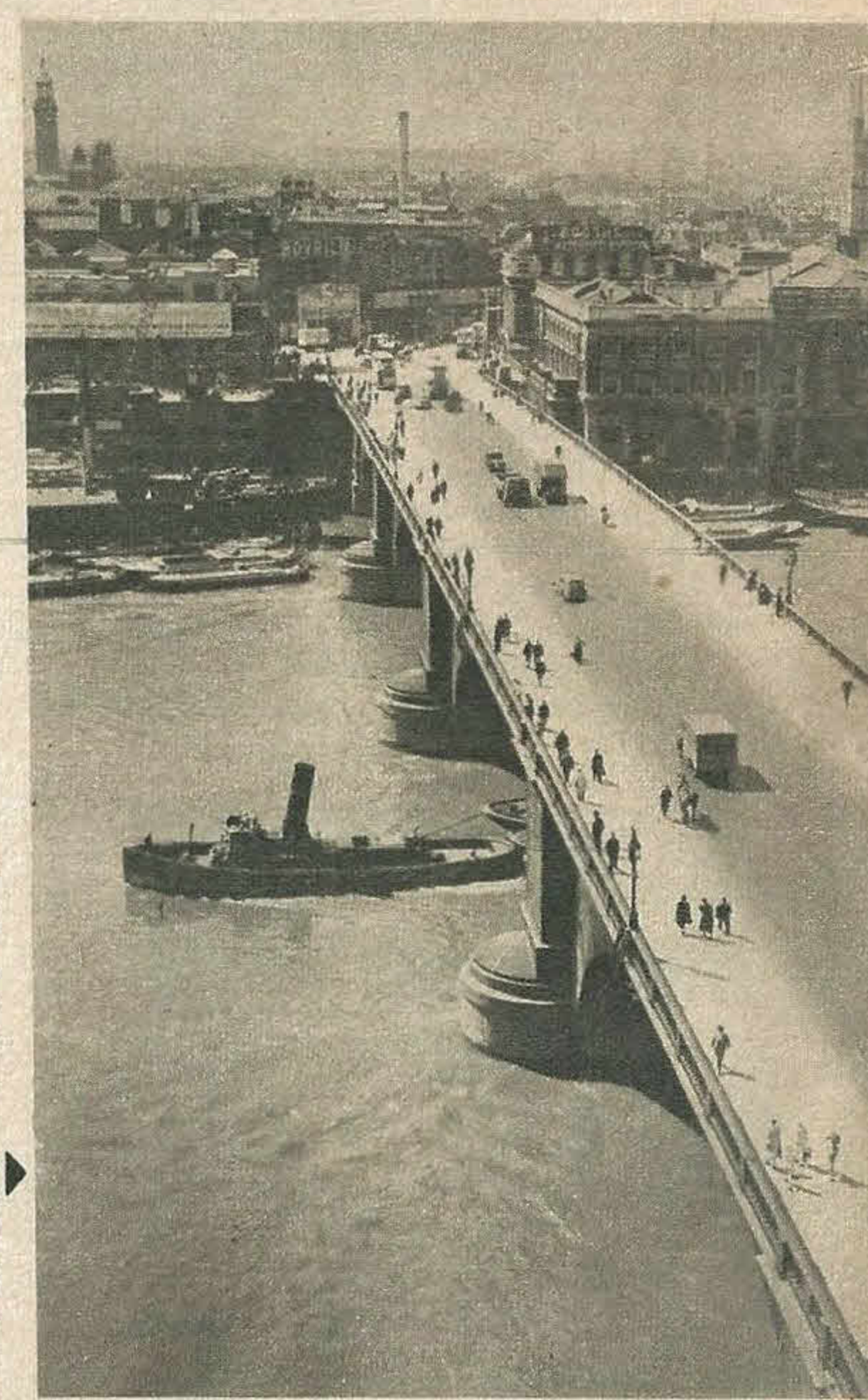


The blacksmith watched appreciatively as the young boy, with uncanny skill, hammered the red-hot metal into shape. Young John Rennie was giving the first proof that he was a born engineer.



Waterloo was another of Rennie's bridges, long admired for its graceful arches. It stood until 1935, and the present one was completed in the year 1945.

On the site of the first bridge ever to span the Thames, Rennie's London Bridge design was revolutionary because it had no "hump" in the middle.



meeting of important London merchants.

"Mr Rennie," their spokesman began, "we need the advice that only your wide experience with docks and harbours can give us. Traffic on the Thames increases, but with the exception of Mr. Jessop's West India Dock, the river has almost no enclosed harbourage. Large vessels have to anchor far down in midstream, endangered by storms and the risk of collision, and their cargoes are pilfered in transit to the warehouses. What do you suggest?"

Rennie's answer was to construct big floating docks—the London Docks—with one middle entrance. This harbourage, giving on to quays and warehouses, had high enclosure walls, and the single entrance lock could be used to control customs and keep the pilferers away from the precious cargoes. Later he built the East India Docks for the East India Company, so he can

really be described as the pioneer of the huge network which today serves London.

Today John Rennie is best remembered for his splendid bridges. He was the first to design the arches of a bridge in such a way that the roadway they carried was flat. He has been called "the man who took the hump out of bridges."

Kelso Bridge over the River Tweed still stands as a good example of his work, and was to be the model for his first bridge over the Thames, for the quiet countryman was to span London's river three times!

Waterloo Bridge, begun in 1811, reached from the Strand at Somerset House to the Surrey side at Lambeth in nine magnificent arches. Its massive piers were founded in coffer-dams or water-tight compartments.

Rennie's second Thames bridge, Southwark Bridge, was hailed by the famous engineer Robert

Stephenson as an unrivalled example of arch construction. It was a graceful structure of cast-iron, and the central span, 240 feet long, was the largest then constructed in that material.

Now the almost derelict London Bridge awaited his genius and he was asked to report on its condition. He advised a completely new structure, and was invited to submit plans.

But time was now against him. He was only sixty, but he had been in poor health for years, and now he was so ill that he was forced to take to bed. Even then he insisted on keeping in touch with the details of his many projects.

Work well done to him was the chief reason for living, and it was a cruel twist of fate that he died just after his designs for London Bridge had been approved. His eldest son, afterwards Sir John Rennie, was asked to carry them out, which he did with triumphant success.

ANSWERS TO QUICK QUIZ (from page 2)

- Literature**
 (1) (b). (2) Lemuel. (3) Sir Richard Steele and Joseph Addison.
Science
 (1) Enzymes. (2) Between the antrum and the duodenum. (3) True.
History
 (1) Lancaster. (2) Nine. (3) Richard I.
Counties
 (1) Nottinghamshire. (2) Flintshire. (3) Down.

- Geography**
 (1) Red Sea. (2) Formosa. (3) Between Greece and Turkey.

- SOLUTION TO CROSSWORD**
ACROSS: 1, Wheel; 4, Wreck; 9, Leave; 10, Lawsuit; 11, Written; 12, Ox-bow; 13, Guy Fawkes; 18, Linen; 20, Turbine; 22, Deaf ear; 23, Drink; 24, Chess; 25, Terms.
DOWN: 2, Healing; 3, Event; 5, Rowlock; 6, Crumb; 7, Blown; 8, Stews; 10, Lancaster; 14, Yankees; 15, Stibium; 16, Blade; 17, Gecko; 19, Neath; 21, Rudge.

ANSWER TO MYSTERY PICTURE (above): JULIA LOCKWOOD

THE WATER FLOWED LIKE WINE...

PEOPLE sometimes make the mistake of thinking that Jesus did not care much for the things that ordinary people enjoy. But there are several stories and sayings in the Gospels which give quite the opposite picture.

One of them is about a wedding feast to which Jesus went as a guest, with Mary His Mother, and his disciples. At first, everything seemed to go splendidly, but halfway through the feast the servants came up to the host and whispered something in his ear which made him look rather embarrassed.

Soon one or two of the guests realized what had gone wrong. Perhaps some had come who were not expected! Whatever the cause, the plain fact was that the refreshments were running out.

When the news was whispered to Mary that there was no more wine, she came up to Jesus, hoping that He might be willing to save their host from the disgrace which such a situation brought.

"They have no more wine," she told him, and paused for his reply.

Empty Jars

JESUS hesitated for a moment. His power was great, but He was careful in its use. He did not want to be known simply as a worker of wonders. This was not the time for Him to work a miracle, and He said so in reply to His Mother.

She, however, felt sure that Jesus would help his embarrassed host. Turning to the servants she whispered, "Be sure and do exactly what He tells you."

Jesus glanced around, and his eyes lighted on a group of tall stone jars, which stood nearby, and which were empty, as they were only used for

special ceremonies. He thought of the unfortunate host.

Calling the servants, He said in a quiet but commanding voice, "You see those water-pots? Fill them up with water."

Soon the servants were carrying skin bottles of water from the well and filling the jars to the very brim.

"Now draw from them, and take what you draw to the table of chief guests," said Jesus.

Astonished

LOOKING at each other in wonder, the servants obeyed, and set new goblets in front of the waiting guests. Soon they were drinking the bridegroom's health in better wine than that which had previously been served to them.

They were so pleased and astonished that they called for the bridegroom.

"This is something new," they said. "Most people serve their best wine first, and then bring out the poorer quality. You have kept the very best for the end of the feast."

Only the servants who carried the water to the jars, and from them the wine to which it had so mysteriously been turned, knew how the host's problem had been solved, and his disgrace avoided. Long afterwards the story became known, and was seen as an unexpected sign of the greatness of the gracious guest, Jesus of Nazareth.

This was the first of many miracles which were to be performed by Jesus in Cana of Galilee.

His disciples, already deeply impressed by the greatness and goodness of their master, were now, more than ever, ready to meet with Him the troubled times which were to come.



Wilkinson's iron bridge spanned the River Severn safely, a masterpiece of engineering.

IRON was in John Wilkinson's blood. He lived and breathed it; the word peppered his conversation, and he hardly wrote a letter in which he did not refer to it. For him, it was the metal of the future, and in the second half of the eighteenth century he was visualizing enormous iron structures that would rank among the wonders of the world.

People jeered at such ideas. It was well-known that iron was brittle and that a casting larger than a fireplace became cracked and useless. But John Wilkinson ignored their sneers, for his smelting furnaces at Coalbrookdale in Shropshire were making iron that he was certain would stand up to stresses and temperature changes.

What made iron brittle was the sulphur given off by the coal during smelting. Wilkinson beat this problem by burning limestone with the coal to counteract the sulphur.

Soot and Fumes

HOW could he prove the value of his improved metal? Why, by making an iron bridge! This was a startling proposal in an age when the use of iron was in its infancy, and when the only bridges in use for the traffic of those days were made of stone or wood.

Wilkinson would not be dissuaded from his idea. He persuaded an architect to design the bridge and had the sections cast in Abraham Darby's foundry at Coalbrookdale. Eventually the scaffolding was placed in position over the River Severn flowing through a deep gorge, and 380 tons of iron were hauled into place.

How the people of Shropshire hated the soot and fumes that blackened the countryside, and how they complained about the glow from the foundries reddening the sky by night! Wilkinson, they declared, was mad.

Then in 1779 the last bolt was tightened and the first carriage rumbled safely over Wilkinson's iron bridge. The castings survived uncracked, the critics were confounded. The first iron bridge in the world was in use.

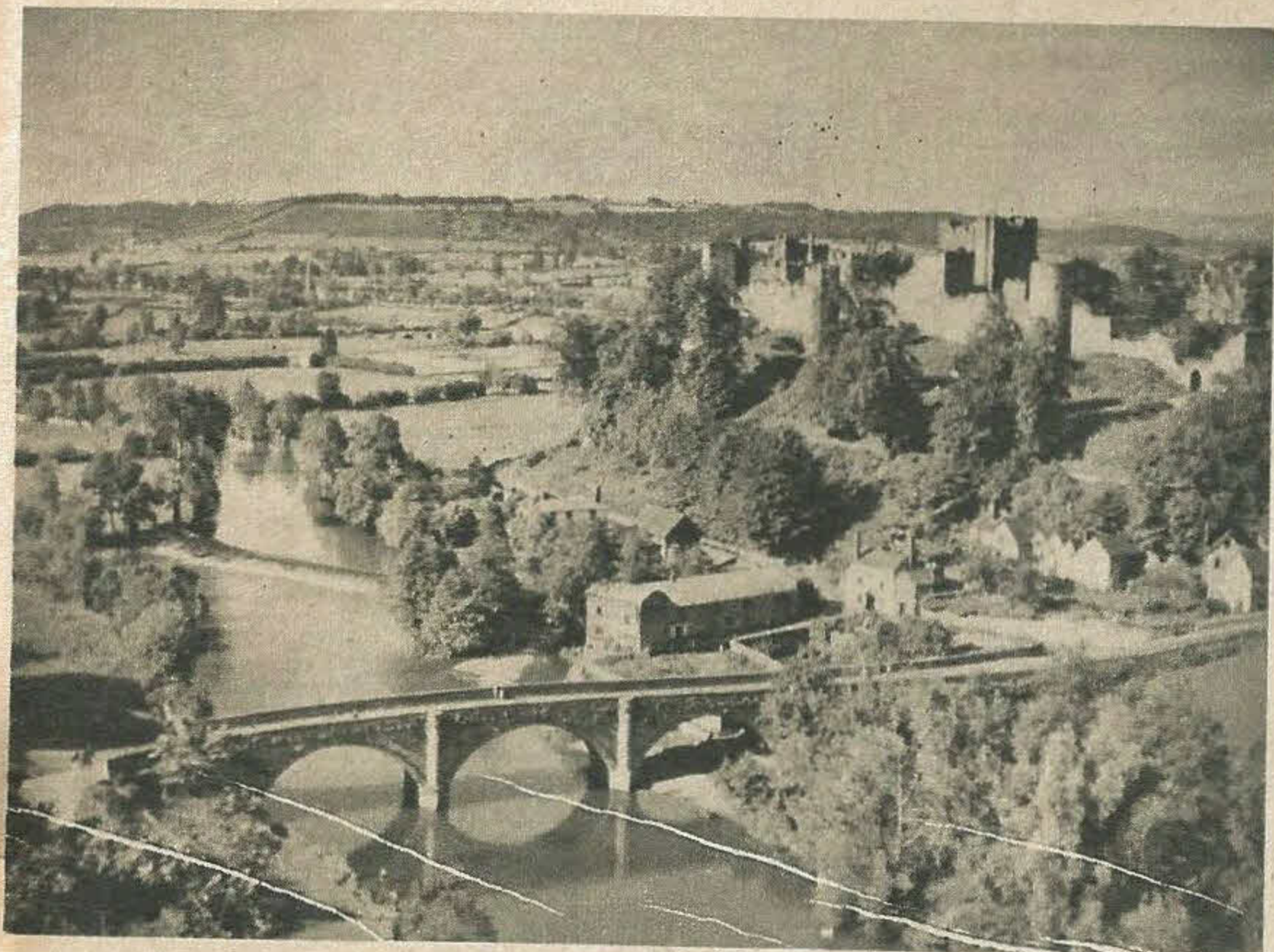
Strange Legacy

IRON has developed into steel and larger and more impressive bridges have been made since, but Wilkinson's bridge was a landmark in engineering that was made possible by the richness of the Shropshire earth. The iron ore, coal and limestone used on the bridge were all mined locally.

During the 184 years that have passed, the iron works and foundries have crumbled and vanished. Chimneys that belched smoke into the air no longer exist. But the bridge still stands—a 196 foot long monument to a pioneer's

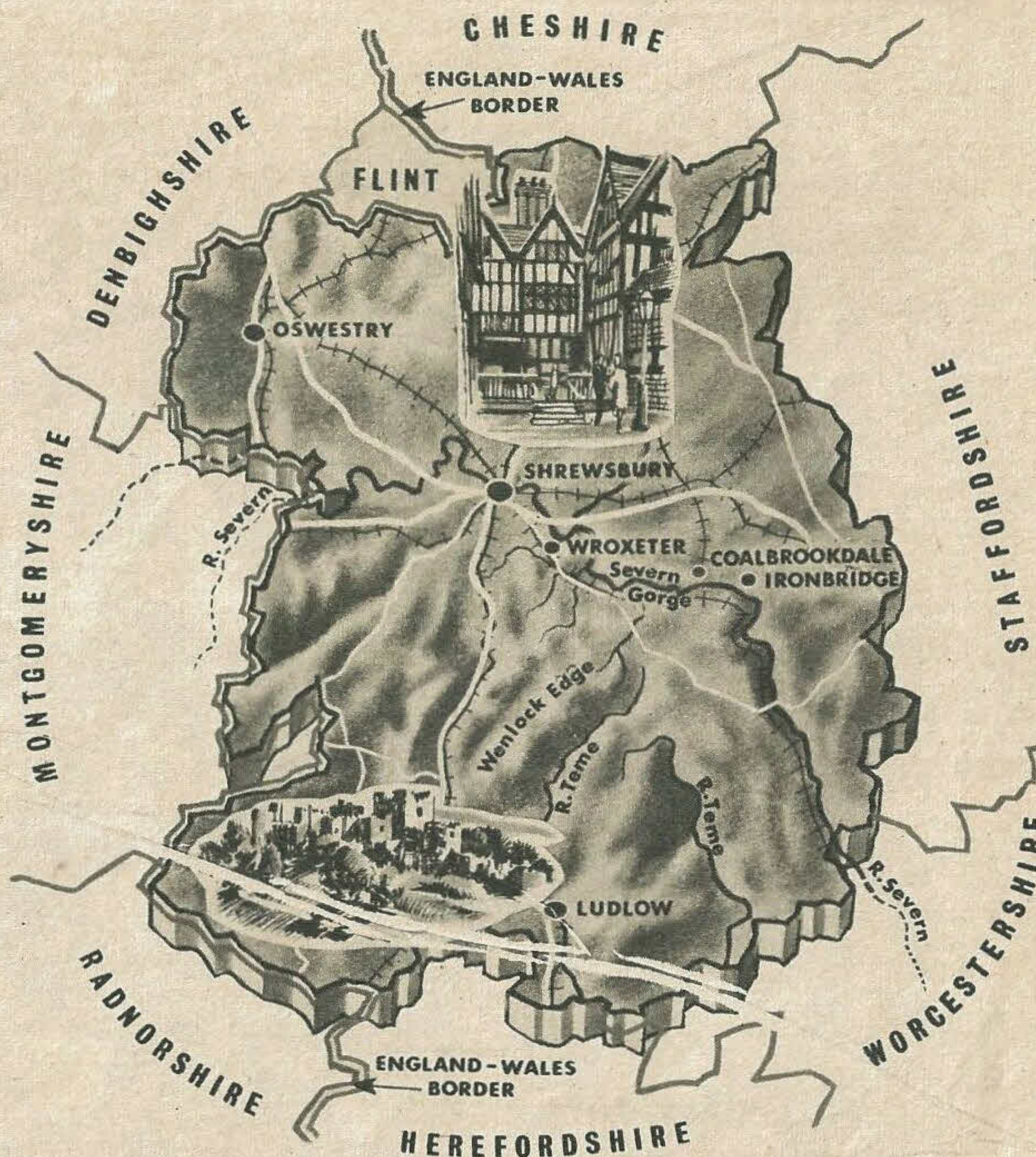


"Fill up those pots with water," commanded Jesus.



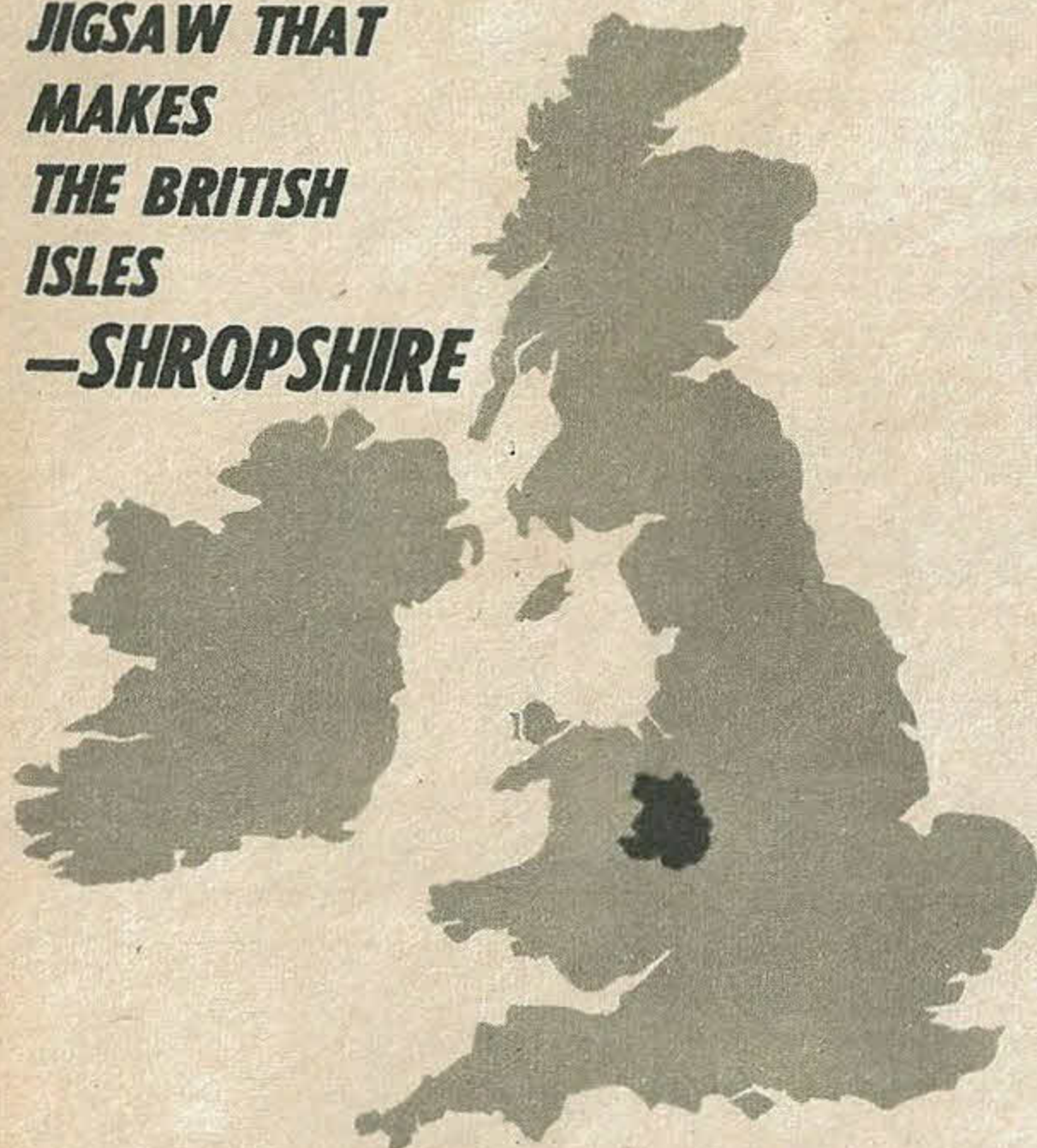
In the fifteenth century the child-king Edward V lived in Ludlow Castle. In 1483 he was placed in the Tower of London by his uncle, Richard, Duke of Gloucester, and he died there that same year.

Shropshire people jeered at the master iron-maker for his "mad" idea—but Iron John's bridge put their county firmly on the map



THE BRIDGE THAT 'IRON JOHN' BUILT

JIGSAW THAT MAKES THE BRITISH ISLES —SHROPSHIRE



courage. Perched on steep, limestone cliffs nearby is a town... appropriately named Ironbridge.

The mark left by the industrial revolution upon Ironbridge has faded, as it has elsewhere in the county. Shropshire today is largely agricultural, with four-fifths of its total area under cultivation. Barley, oats and wheat are grown and cattle pastured in this county, which is set alongside Wales and has Cheshire, Worcestershire and Herefordshire among its neighbours.

History has left a strange legacy on Shropshire. Out of England's 186 castles the county has more than 30—built by the Normans to keep out the Welsh during eight centuries of almost non-stop wars. Among the most famous is Ludlow Castle built by Roger de Montgomery, who became the

first Earl of Shrewsbury after the Norman Conquest. From this castle, the child King Edward was taken to the Tower of London to die in Richard of Gloucester's bid for the throne.

Long before this, Shropshire had been part of the ancient kingdom of Mercia and, in 779, Offa the king built a dyke or barrier between his land and Wales. Parts of the dyke still remain.

Barbaric Sport

DURING the Roman occupation in the first century, A.D., Shropshire was ruled from what is now the village of Wroxeter. Afterwards, the county surged with two great battles in which the Northumbrians were beaten in 642 by the Mercians, who were swept out by the West Saxons in 661.

Through the county flows the Severn, the longest river in England, well known for its salmon and eel fishing. But at one point it loops around a red sandstone castle above a thriving market town. This is Shrewsbury, Shropshire's county town, which has many beautiful timber-framed houses, some dating back to the fifteenth century, lining its narrow winding streets.

Like many of England's rural counties, Shropshire was the scene in bygone years of bull-baiting. King James I is said to have delighted in this barbaric sport, popular in England until it was outlawed in 1835. The bulls were fastened by several yards of rope to an iron ring set in the road; then they were attacked by bulldogs, before being slaughtered for meat.

Oswestry, not far from Shrewsbury, is one of the places where bull-baiting was allowed, because the council's accounts for 1682 include an entry of 7s. for the provision of an 18 lb. bull ring set in a stone slab in the road. There was even a council by-law in some places ordering bulls to be baited before their meat was sold.

SOME FACTS ABOUT SHROPSHIRE

Area: 1,347 sq. miles
Population: 301,920
Chief town: Shrewsbury
Other big towns: Oswestry, Ellesmere, Wellington, Ludlow
Chief occupations: farming, sheep-raising, coal-mining



The cruel sport of bull-baiting was popular in Tudor Shropshire.

HOW IT WORKS—THE AQUALUNG

FREE AS A FISH!

That is how the modern diver feels when he plunges into the depths

THE underwater world has been seen by man ever since the first diving suit was invented over a century ago. But the earlier diver, with his heavy helmet, air tubes, cumbersome suit and weighted feet now seems as old-fashioned as a knight in armour.

Today, the man who wants to go beneath the surface of the sea has been freed from encumbrances by the aqualung which, strapped on his back, provides the

vital air for long periods. With goggles to keep the water out of his eyes, a nose clip to keep it out of his nostrils, a close fitting rubber suit to keep him warm and dry and flippers on his feet to improve his swimming, all he has to do is to turn on the taps at the top of his two cylinders of compressed air, plunge into the water and he is ready for the only region of the earth left for exploration—the deep blue sea.

Here, in close-up, you can see every part of the aqualung, follow the course of the air from the supply cylinders (shown by yellow arrows) as it is breathed in by the diver, and see how it is expelled (pink arrows).

The mouthpiece A has two openings in it, one for breathing in and one for breathing out. These are connected to the inhaling non-return valve B and the exhaling non-return valve C.

Safety Device

TRACING back the yellow arrows to the cylinder you will reach the Demand Valve D. This is like an automatic tap, which releases as much air as the diver takes in with each breath, then shuts it off.

Following the pink arrows of the exhaled breath, you can see where it is released, to float upwards in a cloud of bubbles.

Through the pressure gauge E which he holds in his hand, the diver can see how much compressed air is left in the cylinders, and when it gets low it is obviously time to surface. But supposing he forgets to look? That is where a safety gadget operates.

As pressure gets low the demand valve does not respond so easily. The diver cannot fail to notice that his breathing is becoming more difficult. He then pulls the cord F which operates the reserve valve G and the supply flows again.

Not part of his breathing apparatus, but essential to the diver, is the depth gauge H which he wears on his wrist. This shows him how far down he is.



THE CRAFTSMEN OF ENGLAND

THE
ARTS

All the best furniture is made in France, complained the rich people of England. Thomas Chippendale heard their complaint—and ushered in a new age of elegance in our fashionable homes

AT the beginning of the eighteenth century, many of the great English families who were well-known for their taste in fine art and interior decoration bought their furniture abroad, in France and Italy.

They were powerful and rich, these families, and they wanted great houses to be decorated in continental style as obvious displays of their wealth. Painters, designers and architects were called over from Italy, the home of interior decoration, to improve the English mansions which had already been built, and to design new ones.

English noblemen paid fortunes for highly-decorated furniture which was sent from France. They soon became tired of high prices, of haggling with dealers, and of the cost of transporting cumbersome sofas and tables across the Channel.

Why are there no really first class English furniture-makers? they demanded. Why must we pay out fortunes to obtain furniture from abroad?

English Style

THE answers to these complaints came when a Worcestershire cabinet-maker called Thomas Chippendale began to produce some magnificent pieces of furniture based on designs used during the reign of the French king Louis XIV

Although Chippendale's work was modelled closely on French designs, he was far too great an artist to want to copy other people's work. He admired the highly-decorated French style which had been fashionable in the time of Louis XIV, but refused to imitate it. Instead, he would select the details he liked in the design, and then convert it into his own particular style.

Chippendale was a great admirer of Gothic carving, with its finely-worked tracery, and he must have seen a great deal of it in cathedrals up and down Britain. So he made careful and accurate drawings of the wood carving on pews and organ lofts, then set to work to adapt it for his



A Chippendale chair, circa 1775. Although much of his work was ornate, Chippendale liked simplicity.



Chippendale's workshop in St. Martin's Lane was a meeting place for many famous people of his day.

own use in the design of his magnificent furniture.

Many of his carvings told stories. One suite of furniture told an Aesop fable in pictures.

But it was impossible for one man to produce all the Chippendale furniture which is so highly valued today, so Chippendale trained other craftsmen to carve in his style, and then employed them as assistants.

Chippendale had come to London from Worcestershire about 1750 with his father, who was an expert cabinet-maker. From him, young Thomas inherited the craftsman's skill with the chisel and the awl—but he had genius as well.

Patient Carver

A WORKSHOP was built in St. Martin's Lane, and soon young Chippendale had earned himself a reputation for brilliant craftsmanship. A patient, quiet man, he took the greatest care over his work; every piece of furniture that left the workshop had to be approved first and subjected to minute examination.

Chippendale eventually achieved such fame that his workshop became a popular meeting-place for the celebrities of the day, like Garrick, the actor, Goldsmith, the novelist, and Reynolds and Hogarth, the artists.

In spite of his genius, Chippendale had his enemies. Many other craftsmen of the century were jealous of his success, and Thomas Sheraton, who became famous after Chippendale's death, once said that his designs were antiquated and out-of-date.

Sheraton's view has been contradicted many times over the past 150 years, for Chippendale's magnificent furniture is as much in demand today

as it was when it first left his London workshop.

Thomas Sheraton himself was a highly-skilled furniture-maker. He was born at Stockton-on-Tees in 1751, and did not travel south to London until he was nearly 40.

When he reached the capital, he tried to launch several publishing houses which were to print books on furniture. Although these ventures were a failure and nearly ruined Sheraton, he managed to publish several of his own books on furniture-making. His designs were much simpler and clearer than those of Chippendale, with none of the flamboyant carving that became Chippendale's trade mark.

Sheraton, although a famous name in furniture making, died in poverty. All his money had been lost in his publishing venture, and he was deeply in debt.

George Hepplewhite was another designer whose furniture is sought after today. A favourite of the Prince of Wales, who afterwards became George IV, Hepplewhite made great use of satinwood, which made its first appearance in Britain towards the end of the eighteenth century. Although he loved elaborate designs, Hepplewhite never once over-reached himself by making his furniture too ornate. His chairs were often modelled on elegant oval or circular shaped designs, while he made use of sweeping curves in bureaux and chests of drawers.

Long after Chippendale, Sheraton and Hepplewhite died, other furniture-makers were still copying their designs—for these three men raised furniture-making from the plain, functional trade that it had been at the beginning of the eighteenth century, to a fine art which is still appreciated in these modern times.



A CUP OF OLD ROCK

Next time you have a cup of tea, take a closer look at the cup. It is made from clay composed of rock that littered our Earth millions of years ago

IF New York owes its fame to any one thing it is to its skyscrapers. On the tiny island of Manhattan, less than thirteen miles long, these soaring buildings have crowded out the space and most of the sunlight too, so that the city seems to be fighting for its breath. Were it not for the fact that the island were made of solid rock, the whole city would sink like a stone into the Hudson river with the weight of its buildings.

London could never survive this kind of dense building. For the City of London lies on a bed of clay that is too soft to support great weight. The name "clay" comes from the Old English word *claeg*—a word which captures exactly the sticky, clinging texture of clay.

Clay is not always wet and soft. When baked in the hot sun it becomes quite hard and bright red. We use it for making bricks—which is why we have the colour called "brick red." Primitive man used baked clay for pots to carry water, and for building houses.

Baked clay in fact is very valuable. Because it is easily moulded and then easily hardened it has



The sun-baked and gaily decorated huts of these Zulu girls are strong and rainproof. Even today ordinary bricks that we use for building our houses are made from clay.



Wet clay can easily be shaped or "thrown" on a potter's wheel. The spinning wheel allows the potter to keep clay smooth and even on all sides.

been used for sculpture, and more importantly, for pottery. A Ming vase made from clay in China over three centuries ago is today worth several thousand pounds.

As the earth gets older the amount of clay in the world gets larger and larger. For millions of years, rain, wind and freezing ice have been wearing away mountains and valleys. Streams, rivers and waterfalls gradually wear down the broken bits of rocks into pebbles and gravel. As the pebbles are swept down the rivers they are ground down farther into sand. The sand grains slowly get smaller in their journey downstream.



Clay is ideal for sculpting. When this model is finished, a plaster-of-paris mould will be made from it, and from the mould the final version of the figure will be cast in metal.

The final result of this wear and tear on the earth is a mixture of minute rock particles and water—that is, clay.

The particles and the water are not a mixture in the ordinary sense of the word. If you stirred up a few spoonfuls of fine sand in a glass of water you would soon find that the sand eventually settled at the bottom leaving the clear water above it.

But the fine rock particles and the water that is in clay do not separate out like this. Instead the rock particles are so small that the force of gravity tending to pull them downwards is actually less than the strange electrical force that exists in the particles of water that surround each speck of rock.

Electrical Force

BECAUSE of this electrical force the rock specks and the water remain in a state of balance, as though they were clinging together. Scientists call this type of "mixture" a "colloidal suspension." The word "colloid" is taken from the Greek word *kollo*, which means glue, and in a sample of clay the particles of water and rock are in fact glued together.

If the clay is baked in the sun or in special ovens called "kilns," the water evaporates or dries out, and the rock particles then cling together by the force of their own electrical attraction.

The clay becomes a solid rock again.

So when a potter "throws" a piece of wet clay on his potter's wheel (above) to fashion a pot or a vase, and then bakes it in his kiln until it becomes rock-hard, he is actually reversing the million-year process of nature.

It is exactly this reverse process that takes place when we make our "china." Cups, plates and saucers are called "china" because the type of clay from which they are made, kaolin, was first used at a place called Kaulin in China.

When this clay came to Europe to be fashioned into dishes and crockery, it was called "China clay," and the things made from it were called simply "china."

Continuing the original adventures of the world's most famous schoolboy

THE STORY SO FAR

Bunter, the fat junior of the Remove form at Greyfriars School, sees that a local paper is offering a prize of ten guineas for an essay on the history of the district. Mr. Quelch, master of the Remove, is writing a History of Greyfriars, and Bunter steals one of the newly-completed chapters and enters it for the competition. By a trick he persuades his form mates, Skinner and Bolsover, that they have burned the manuscript, but one day in the local town they see copies of the paper announcing Bunter as the winner of the essay competition. They realize how they have been fooled, and hurry back to the school.

THE SEVENTH CHAPTER

Trials of an Author!

BOSH!" "Piffle!" Such were the words that fell on the ears of Bolsover and Skinner as they passed through the school gates, on their arrival at Greyfriars again.

The two Removites had returned to Greyfriars as quickly as the local train and their legs would carry them. During the entire journey they had spoken of nothing else but Skinner's discovery of Bunter's trickery.

Skinner and Bolsover were angry, and disgusted with themselves for being taken in by Bunter so easily. The two allies tramped through the school gates and immediately spotted the fat object of their wrath surrounded by an excited crowd of Removites.

"I tell you it's true!" Bunter was howling as they approached the group.

"Rats!"

"Tell that to the marines!"

"But it is!" hooted Bunter, blinking furiously at the incredulous Removites through his big spectacles.

"Rot! If you have written this thing and been paid for it, why can't you show it in print, then?"

"I—I—Well, there are certain reasons why I can't actually show you," said Bunter lamely. "But I assure you that's how I got the cash."

"No, it won't wash, Bunter," said Harry Wharton, looking at the Owl with a rather puzzled expression on his face. "You've got to give us some proof."

"But I've got proof! I've got the ten guineas—that's proof enough, ain't it?"

"Well, not quite!" said Wharton. "In fact, it's your having ten guineas that's worrying me!"

"Oh, really, Wharton!"

It was at that moment that Skinner and Bolsover came through the crowd.

"This is where we take a hand with that fat villain!" said Bolsover gruffly.

"Oh, really, Bolsover—" The Owl of the Remove blinked at his late allies in alarm.

"You take a back seat, Bolsy!" said Skinner. "I'll do the talking!"

"I say, you fellows, don't take any notice of Skinner!" said Bunter anxiously. "I don't know what he's going to tell you, but it ain't true!"

"I suppose the fat villain has been telling you he's won a ten-guinea prize for an essay," said Skinner.

"Right first time!"

"I say you fellows, I've just remembered an important engagement!" Bunter gasped, moving hurriedly away.

"You've got an important engagement here, my fat tulip," said Bob Cherry, seizing Bunter's ear firmly but gently and guiding the quaking junior back to the centre of the group. "Now come on, Skinner, who wrote that blooming essay?"

"Why, none other than dear old Quelch," grinned Skinner.

"Wha-a-at!"

"The subject of the essay was local history," Skinner went on. "Now, who's the bright boy who is going to get what I'm driving at?"

"Great pip," breathed Frank Nugent. "The missing chapters of old Quelch's history! Pinched by this fat fraud and entered for the competition!"

"Right all along the line!" Skinner agreed.

"If you want the proof, here it is!"

And with that he produced six copies of the *Courtfield Express* and handed them round. There was a roar from the juniors.

"What a twister!"

"What a rogue!"

"Can't you let a chap speak?" howled Bunter above the din. "I tell you, I wrote the beastly essay!"

"You fat fraud, can't you see the

BUNTER BOWLED OUT!

by FRANK RICHARDS



"If you want the proof, here it is!" said Skinner, producing several copies of the *Courtfield Express*. Bunter trembled with fear as he realized that the game was up.

game's up?" Harry Wharton demanded. "I say, Wharton, you're not going to sneak, are you?" Bunter asked in alarm.

It was a difficult decision the Captain of the Remove had to make. Bunter was more of a fool than a knave, but his deception was bound to come out sooner or later, and something had to be done to try to save him.

"I've made up my mind," Wharton said at last. "I'm going to see Quelch and put in a word for this fat ass. I want you to keep a watchful eye on him and have him ready when I come out for him."

"Right-ho, Harry," said Bob Cherry. "See what you can do for the chump."

"The chumpfulness is terrific," said Hurree Singh in his strange English.

"Yah! Sneaks! Rotters!" howled Billy Bunter furiously as they marched him along. "Lemme alone! I don't want to see Quelch!"

"I don't suppose you do, porpoise," Bob Cherry said seriously. "Unless Harry's able to melt old Quelch's heart, you're for the high jump!"

THE EIGHTH CHAPTER

On the Carpet!

WELL, Wharton?" said Mr. Quelch, looking up from his work.

"I've come about the manuscript you lost, sir. I think I've found what happened to it."

Mr. Quelch sat bolt upright in his chair.

"What happened to it?" he asked.

Wharton hesitated.

"You remember you said that you would not ask me to give any names, sir? Well, as things have turned out, I can't very well avoid doing that. But I wanted to ask you whether, as I've brought you the information, I might say a word for the boy responsible."

"Really, Wharton—"

"You see, sir, the stunt he's worked may strike you as absolutely criminal. But however bad it looks, I think that the chap concerned is such a prize idiot that it's not as bad as if an ordinary fellow had done it. So I thought if I put in a word first, sir, you might not have him bunked—er, I mean expelled."

"You may rely on it that the judgment of the headmaster and myself will be as impartial and as lenient as possible. Beyond

that I cannot go. Now, Wharton, who was it?"

Wharton produced the copy of the *Courtfield Express* and laid it in front of the master. Mr. Quelch read it as if hypnotized.

"B-bless my soul!" he exclaimed. "That wretched boy Bunter has won a prize of ten guineas with my essay! Send him to me at once!"

Harry Wharton, feeling that he had done his best, quitted the room. A moment later Billy Bunter rolled reluctantly into the dreaded apartment. He quaked when he saw the expression on the master's face.

"Oh crumbs!" he gasped.

"Do you dare to deny, Bunter, that the essay with which you have won a prize in this—this publication, is my work?" he thundered.

"Oh really, sir, how can you think such a thing?" said Bunter desperately. "W-w-what ever put that idea into your head, sir?"

"It was put into my head by the strange fact that your winning essay is identical with that part of my History of Greyfriars which has been lost!" ground out Mr. Quelch. "What have you to say to that, Bunter?"

"All—all I can say is, sir, that it's a case of great minds thinking alike!" said Bunter hopelessly.

"Wha-a-at!"

"G-great minds th-thinking alike, you know," said Bunter, less hopefully. "It's often been known before, sir. Two geniuses hit on the same idea and work it out in the same sort of way—"

"You are an inordinately stupid and wicked boy!" roared Mr. Quelch. "Were it not for the scandal that would be associated with the name of Greyfriars I should seriously consider sending for the police now!"

"Oh, lor!" gasped Bunter. "D-did you say the p-police, sir?"

"I did!" barked the infuriated form master. "And there is not the slightest doubt that if I did have you charged you would be sent to a reformatory for a long period, Bunter!"

"Oh crumbs! D-d-do you think so?" groaned Bunter, his hair almost standing on end at the dreadful thought.

"I am certain of it! Do you realize, Bunter, that you have committed a criminal offence, or is your stupidity so great that the seriousness of it has not fully penetrated your brain?"

"Oh, dear! I—I didn't know it was as bad

as that, sir!" blabbered Bunter, overcome with remorse as he blinked up at Mr. Quelch's scornful face. "Please sir, don't have me expelled!"

"The matter is too serious for me to adjudicate on," said Mr. Quelch, his face relenting a little as he glanced at the woebegone appearance of the fat Removite. "I shall have to take you to the headmaster and report the circumstances to him. I begin to think that you are not quite responsible for your actions, Bunter. Tell me exactly how you came to do this thing."

And then, for once in his career, William George Bunter told the truth. With his fat knees knocking together and his big eyes blinking quite pathetically behind his big spectacles, he related the whole story.

"A sordid affair!" was Mr. Quelch's comment when he had finished. "And did it not occur to you, Bunter, that the whole thing was bound to come out if you won the competition?"

"N-n-no, sir!"

"Dear me!" the master sighed. "Wicked and mercenary as you are, Bunter, I am afraid that your stupidity exceeds either of those two qualities. Well, we must see Dr. Locke!"

Bunter was not expelled.

Horrified and disgusted as the Head was when he heard the story, he, like Mr. Quelch, was influenced by the stupidity Bunter had shown. And when Mr. Quelch mentioned Harry Wharton's intervention, the weight was just turned in Bunter's favour, and the extreme sentence of expulsion was not passed.

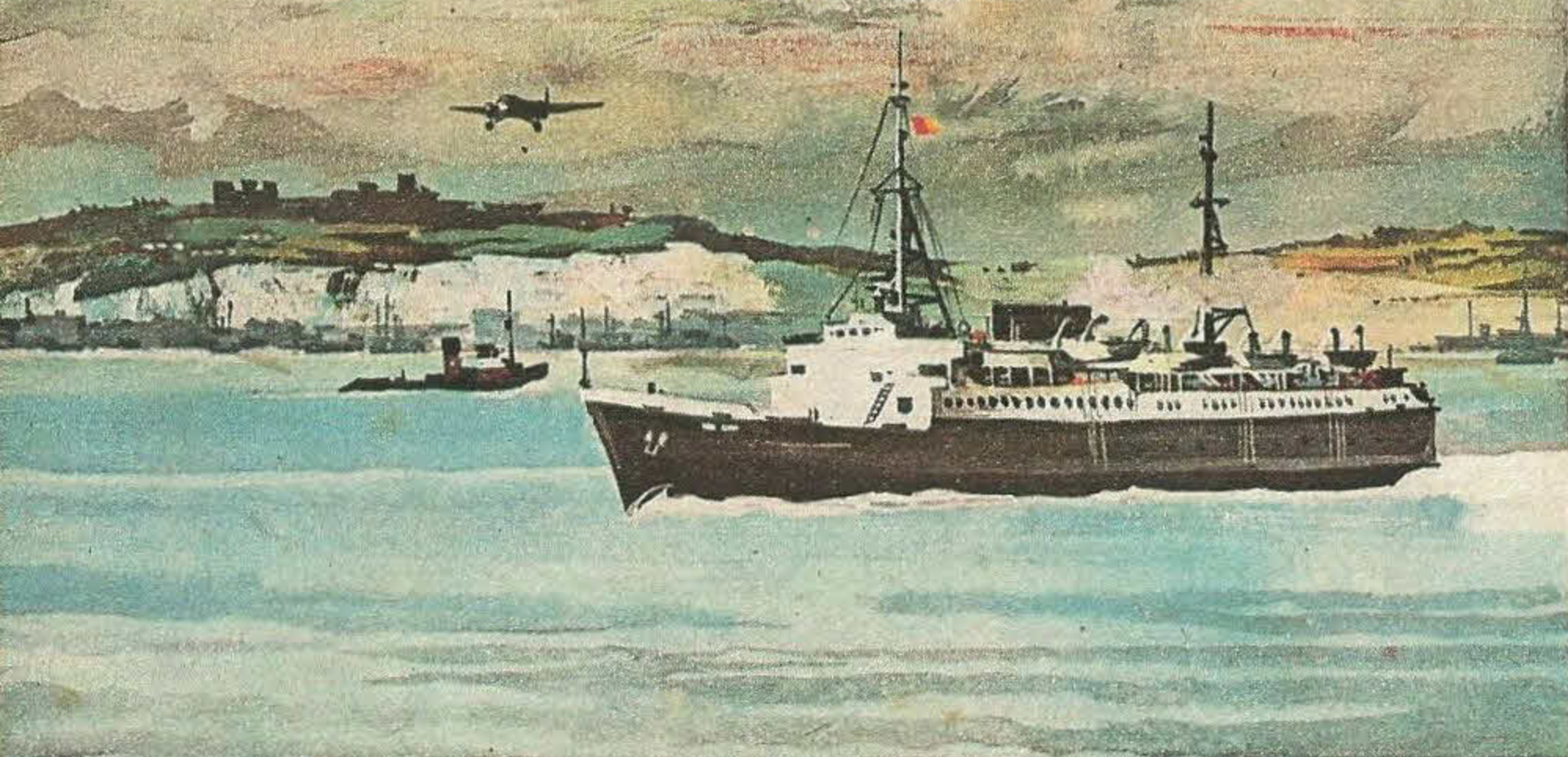
But Bunter received the caning of his life, and never did anyone regret adopting a literary career more than Bunter on the morning when the event took place. Of course, he had to hand over the rest of the prize money, and Mr. Quelch donated this to the school sports clubs.

It was quite a long time before Bunter was his old self again, and for many weeks, to cause the Owl of the Remove to quake like a jelly, it was necessary to whisper only three short words—"Bunter's Prize Essay."

**NEXT WEEK:
BUNTER THE BANDIT!**

TUNNEL—OR BRIDGE?

1. After the end of World War II in 1945, the Channel became a link with Europe once more instead of a defence moat. Frequent London trains now connect the Kentish ports with cross-Channel steamers, and air flights cater for holiday-makers and their cars.

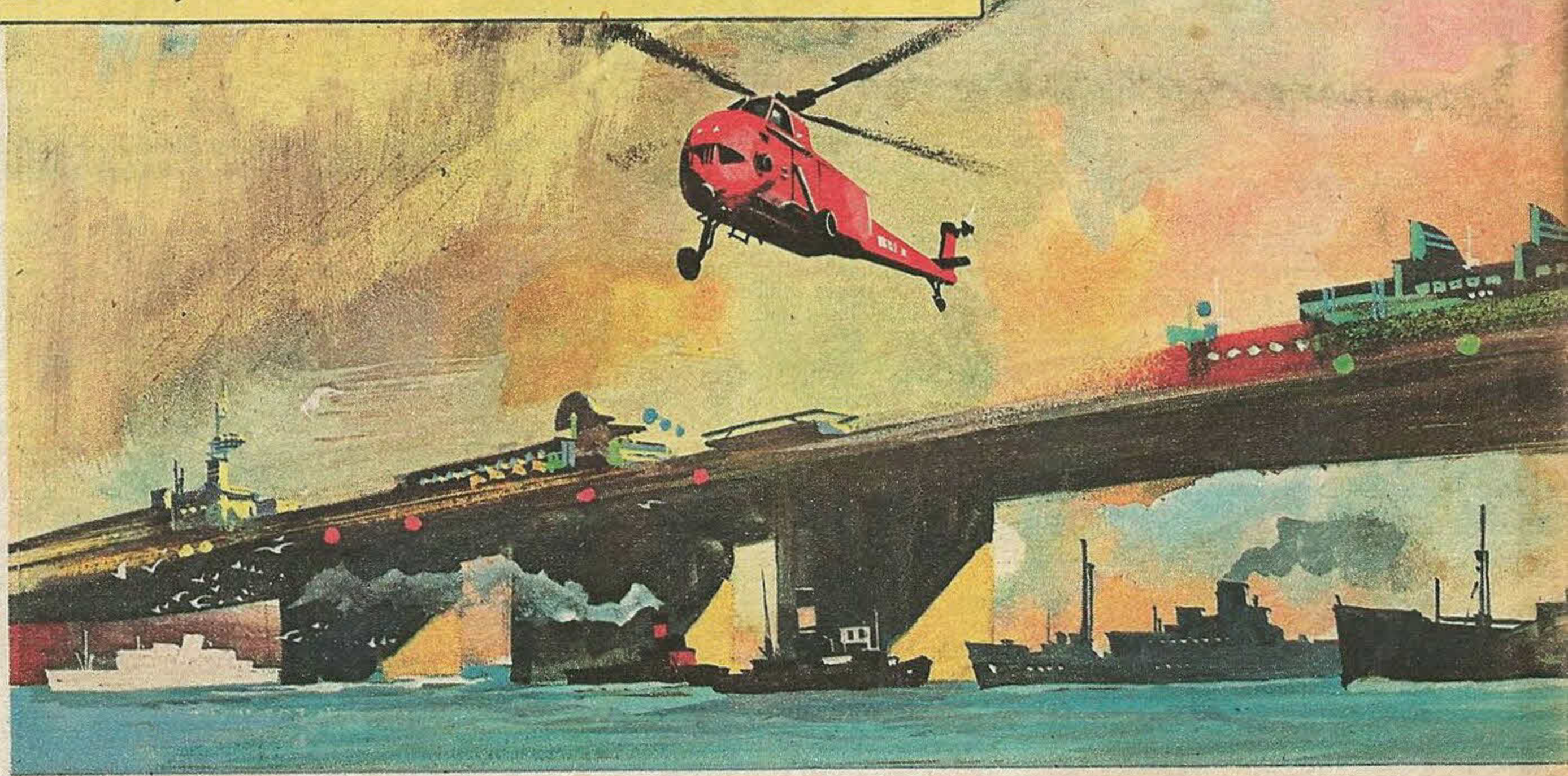
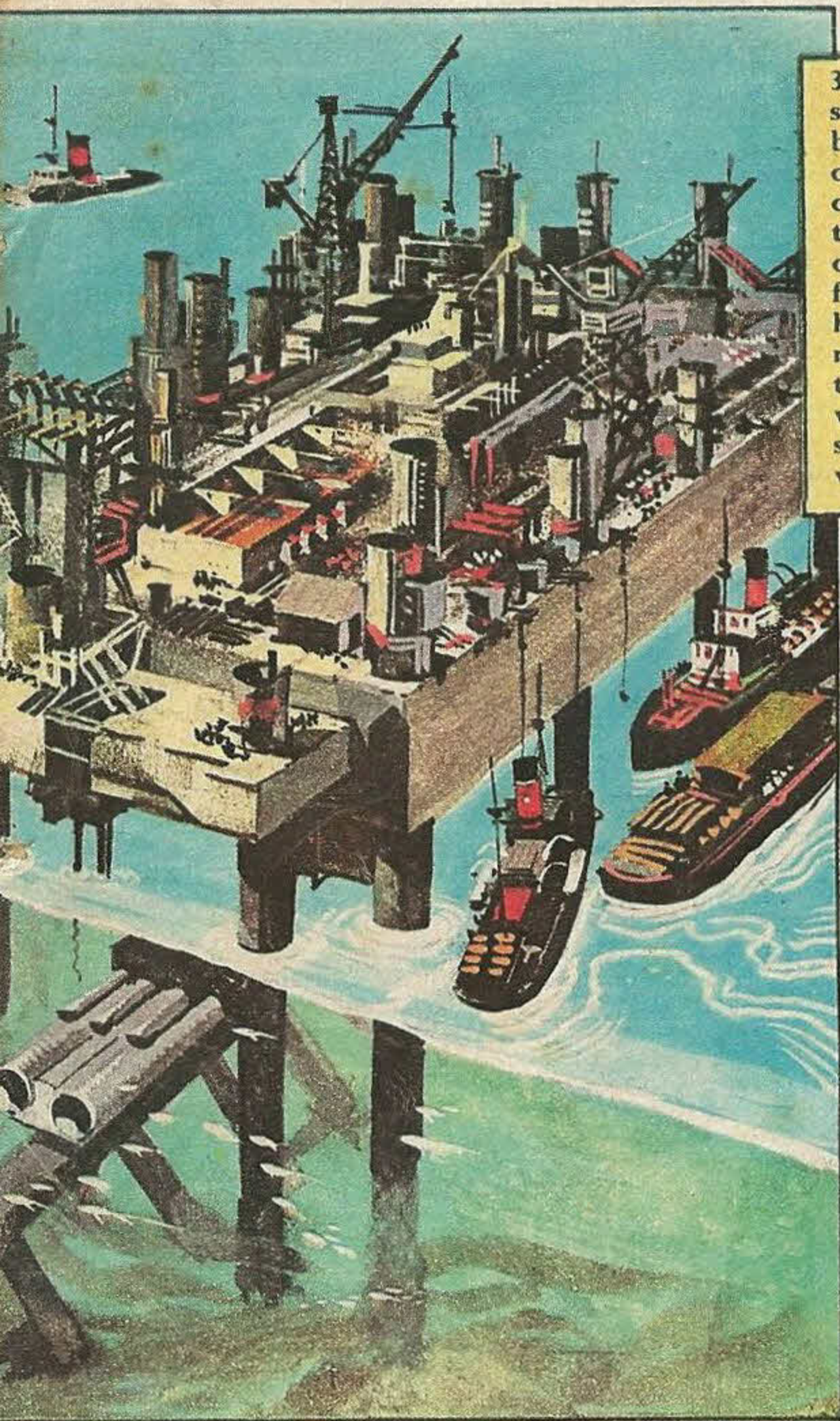


2. But a closer link is needed to cut travelling time between the French and English capitals. Tunnel, or "chunnel" schemes have been raised again, with other ideas for a quick crossing.



3. One plan is for twin tunnels in pre-cast sections to be sunk and buried in the seabed. This would be done by machinery operated from a huge platform mounted on legs (left). The tunnels would be thirty miles long, carrying railway tracks only, because ventilation for car exhaust fumes would be difficult. Suggestions have also been made for moving pavements. Some French engineers favour the scheme for a bridge (right). This would be only twenty-one miles long, stretching from Dover to Calais, but would cost nearly twice as much as the

tunnels. Building would take six years—twice as long as the tunnels. The bridge would carry eight roads, two railways, restaurants and motels. The steel structure, built 230 ft. above the waves on concrete piers, would carry radar devices to warn shipping in foggy weather. An overhead track for hovercars at 100 m.p.h. has been suggested, taking an hour from London to Paris. There is also a scheme for a huge dam supplying electric power and also carrying traffic. Locks would allow vessels through the dam. The schemes are under review now.



4. The quickest water route yet suggested for crossing the Channel is by hovercraft. Passengers would complete the journey in 15 minutes in fair weather.



5. We end our story of ships in the Channel as we began—with craft under sail. For in spite of all the more modern ideas, such boats are still seen at summer regattas all along the coast. Men and women will continue to brave the waters in little craft.

