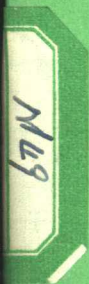


Longman Structural Readers: Non-Fiction
Stage 3

The world under the sea

Michael Buckby and Andrew Wright



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Longman

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THE WORLD UNDER THE SEA

INTRODUCTION

There are about 3,500 million people in the world. There will be about 7,000 million people in the year 2000. Where will they find enough food? Already 1,500 million people do not have enough food. What will happen in the year 2000?

Perhaps man will find the answer in the sea. The sea is full of food. The sea and the seabed are also full of other things. Many animals live in the sea. Many plants grow in it.

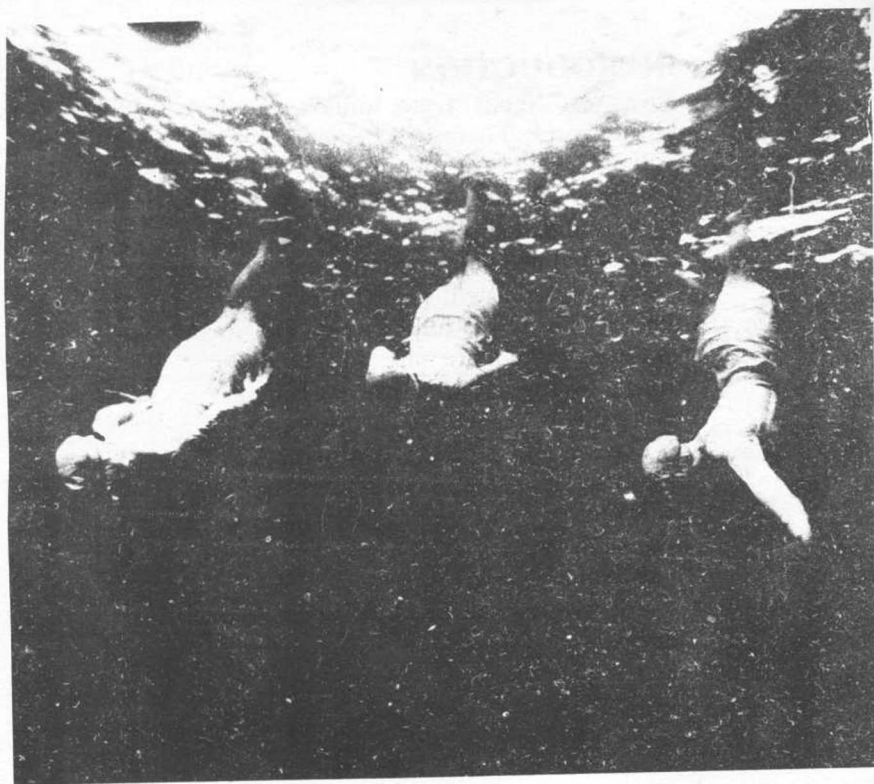
The sea will perhaps save man, if we look after it. But will we look after the sea? We have not looked after the land very well.

Whose is the sea?

Will the sea still be alive in the year 2000?

THE HISTORY OF DIVING

For thousands of years, people have wanted to explore the sea. They have looked for pearls and they have caught fish. Many people can stay under water for half a minute. The Japanese women in the photograph can stay under water for about three minutes. But three minutes is not enough time to explore the world of the sea.



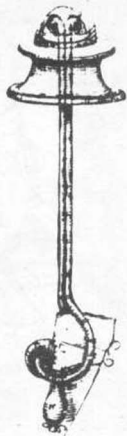
Leonardo da Vinci was an Italian who lived from 1452 to 1519. Leonardo wanted to stay under water for a long time. He had an interesting idea: a man could put heavy stones on his feet and wear a mask. The man could breathe through a tube.

This idea is interesting but not very good. You can breathe through a short tube in very *shallow* water but you can't breathe through a tube in *deep* water. Leonardo didn't try his idea!

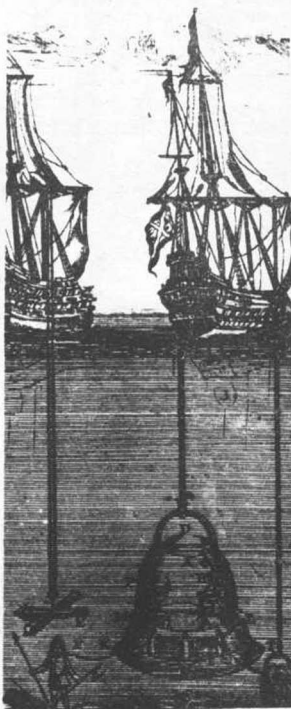
In 1538, Charles V of Spain watched two Greek divers. They got a very big and heavy bell and went inside it with a candle. The king's men put the bell into the River Tagus, and pulled it out of the water again after ten minutes. The divers were alive, their clothes were dry and the candle was still burning.

In 1690, Edmund Halley made a better diving bell. He went down to about 20 metres and stayed there for an hour and a half. The bell was 3 metres tall, there were windows in it and seats for the divers. The divers breathed the air in the bell and also breathed the air from two heavy barrels. But Halley's divers couldn't see very much and they couldn't walk about. So Halley made some smaller bells. His divers breathed the air inside the small bells and walked about on the seabed. They were able to work under water but it was very difficult.

Now people could stay under water



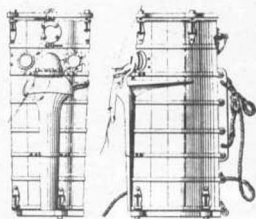
Leonardo da Vinci's tube



Halley's diving bell



Borelli's bag of air



*Lethbridge's
diving barrel*



for a long time but they could not move about easily.

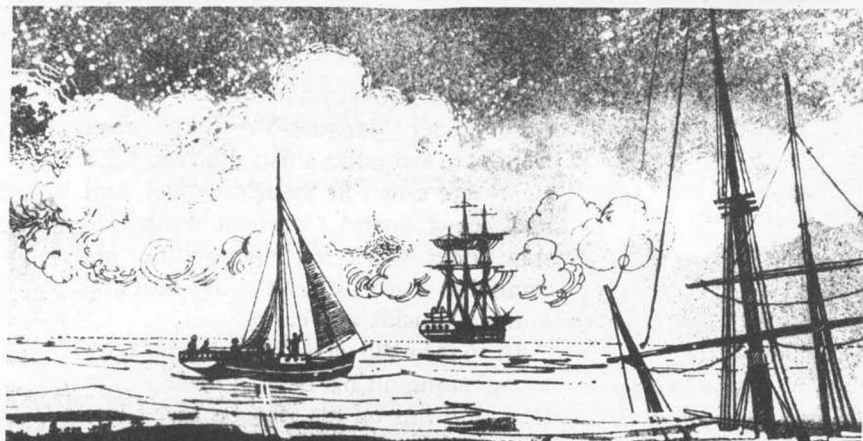
Alphonso Borelli (1608–1679) wanted to move about easily on the seabed. He thought that the bell was a bad idea, so he made a big bag. He filled the bag with air and tried to breathe it. But he couldn't hold the bag under water; it pulled him to the top. Borelli also made some fins and tried to swim under water. (In 1943 Commander Jacques Cousteau swam under water. He had a 'bag' of air on his back and wore fins on his feet!—see page 8.)

In 1745, an Englishman, John Lethbridge, stayed for half an hour under water in a barrel. He could see and he could walk about but he couldn't work easily. Lethbridge dived many times, and in 1749 he said that he had dived to 21 metres.

In 1819, Augustus Siebe made a helmet and diving suit. The divers did not like the helmet very much: the air could suddenly come out of it under water! Some divers died. In 1837, Siebe made a new, better helmet; the air could not come out of it. The divers could walk and work easily at the bottom of the sea. A tube went from the helmet to a boat; men in the boat pumped air to the diver.

In 1839, some Englishmen dived down to a big ship on the seabed. The ship was the *Royal George*; it lay in shallow water near Gravesend, England. The divers wore Siebe's helmet. They worked for

Siebe's helmet



many weeks and learned many lessons. The *Royal George* was not just a ship, it was a school for divers!

In 1844, a French scientist used Siebe's helmet. He was the first scientist to explore the seabed. He dived near Sicily in the Mediterranean and brought back many interesting plants and animals.

Siebe's helmet and suit have not changed very much; many divers use the Siebe helmet and suit today. One small change—there is usually a telephone from the helmet to the boat. Divers can stay under water for three hours and they can go down to 60 metres. But they cannot move *quickly* and they must stay near the boat. Without the boat they cannot go up and down and they cannot get air.

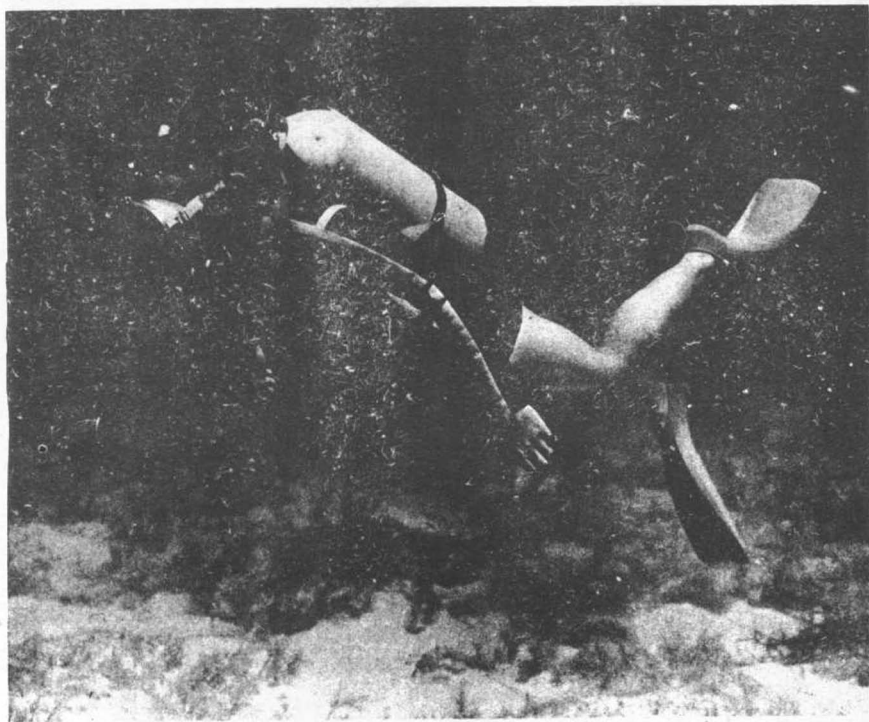


COUSTEAU'S AQUALUNG

Commander Jacques-Yves Cousteau wanted to swim like a fish. But you can't swim like a fish in Siebe's helmet, suit and heavy boots! Cousteau wanted to stay under water for a long time. He wanted to leave the boat above him and to move quickly and easily.

*a diver with an
aqualung on his
back*

In 1943 he did all of these things. With an aqualung on his back, a mask on his face, and fins on his feet, he dived into the Mediterranean. His wife swam above



him. Through her mask she could watch her husband down below. He went down and down.

Cousteau said that he 'flew around in the water...'

Diving is easy now. But is it dangerous?

DRUNKENNESS OF THE DEEP

On October 17, 1943, Didi Dumas dived to 70 metres. Dumas was Cousteau's best diver.

Afterwards he said that he couldn't see clearly. He felt really wonderful; he felt drunk and carefree.

He continued, 'I forgot Jacques and the people in the boats. My eyes were tired. I went deeper, I tried to think about the bottom but I couldn't. I wanted to sleep but I couldn't.'

Dumas had been 'drunk'. But he had not drunk any whisky or wine! There was too much nitrogen (N) in his body. The nitrogen came from the air in his cylinder. At 70 metres the nitrogen in the diver's air is very dangerous. Free divers now do not go deeper than 50 metres.

In the summer of 1947, Cousteau dived to 100 metres. Then Maurice Fargues dived to 130 metres, but he died under water. Perhaps he had become 'drunk'. Since 1947 many 'free' divers have died. In one year nine free divers died in the North Sea.

Diving is both easy *and* dangerous.

A FREE DIVER NEEDS . . .

A wetsuit :

The wetsuit is made with little holes filled with gas. Water fills the space between the suit and the diver. His body warms the water and this keeps him warm.

A watch :

The watch is important. A diver must plan the time of his dive.

A depth gauge :

The depth gauge is important as well. The diver must not go too deep.

A life jacket :

The life jacket can save the diver.



wetsuit



snorkel



knife

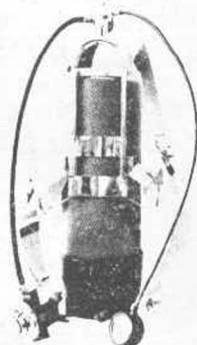


weights

underwater watch



mask

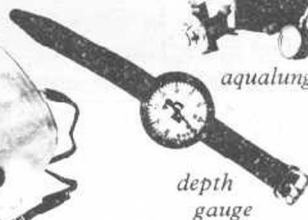
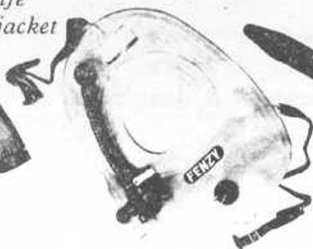


aqualung



fins

life jacket



depth gauge

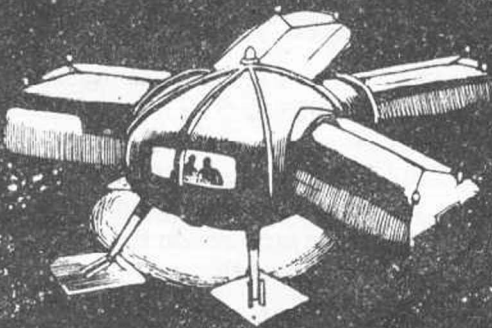
HOUSES UNDER THE SEA

But Cousteau was still not happy. 'Men will not really know the sea,' he said, 'if they only stay a few hours under water.'

With an aqualung, a diver was free, but his visits to the seabed were very short.

If a diver goes deeper than 9 metres and stays there, the pressure makes more nitrogen go into his blood. If he comes up too quickly, the nitrogen forms bubbles in his blood. This can kill him.

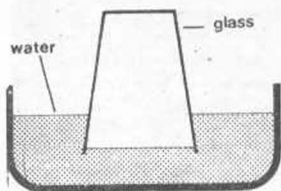
Then a scientist found out something important. After a few hours at this depth, no more nitrogen goes into a



diver's body; even if he stays there for a few weeks. So it was possible for man to live under the sea for days, weeks and, perhaps, months.

Again, Cousteau led the way. He built the world's first underwater house. He named it Conshelf I, short for Continental Shelf Station Number One.





If you put a glass into water, the water does not go into the glass.



Conshelf's door is always open.

Two men lived for a week in Conshelf. They also worked hard for five hours every day. They showed that man could both live and work for a long time under the sea.

Air and electricity came into the house from the ship. There were lights in the house, and the divers could cook food. They had a telephone and a television, so they could talk to the people in the ship and also see them.

The divers had their own name for Conshelf: this was Starfish House. Cousteau explains:

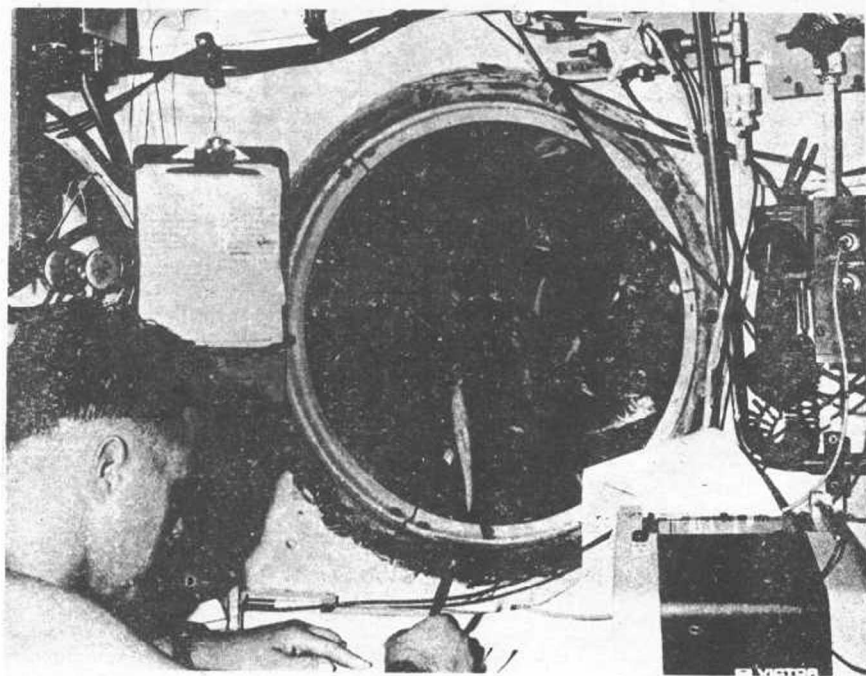
'A starfish has five arms. Starfish House has four arms. These arms are rooms. The divers cook, eat, sleep and work there.'

Conshelf's door is under the house. It is always open. Water and air meet there, but the water cannot go into the house. Why not? Look at this glass in some water: the water does not go into the glass. And for the same reason the water does not go into Conshelf.

After Conshelf I, Cousteau built Conshelf II and then Conshelf III. Six men lived and worked for three weeks in Conshelf III, over 100 metres down.

While Cousteau was working on Conshelf, the U.S. Navy built another underwater house, the Sealab. In 1964, four aquanauts lived and worked for ten days 58 metres down, in Sealab I.

In 1965, the U.S. Navy put Sealab II in colder water, nearly 65 metres deep.

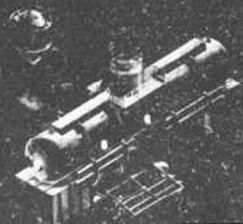
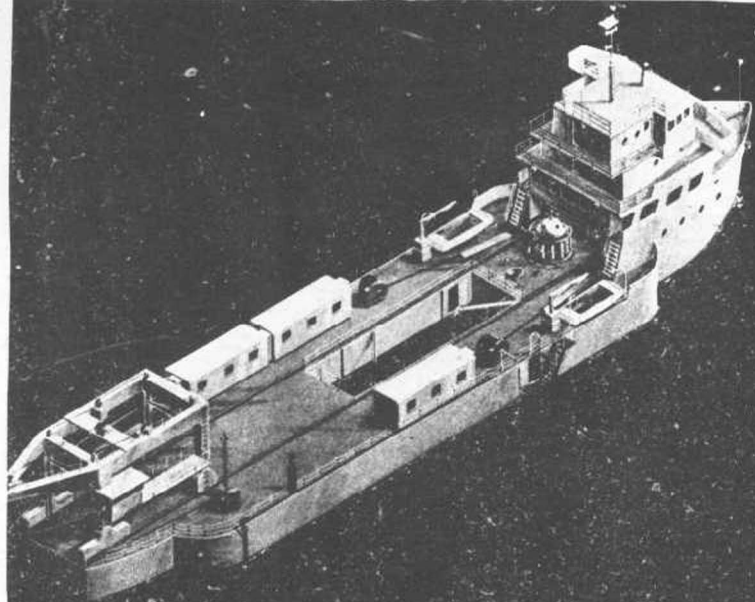


inside Sealab II

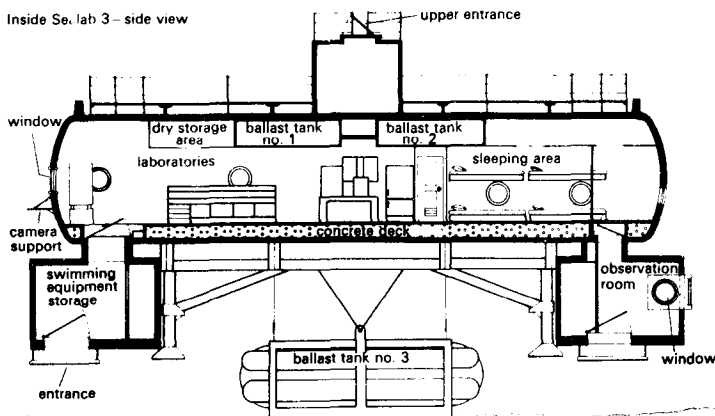
Teams of ten aquanauts lived there, some for 15 days and others for 30 days. They used dolphins to carry things from the surface to Sealab and to find lost divers (see page 30).

Then, in 1969, divers from Britain, Canada, and Australia worked with American divers in Sealab III. Eight men could work in Sealab III for 12 days, 185 metres down.

Inside these houses under the sea it is warm, but the water outside is very cold. Wetsuits do not work well below 30 metres. The pressure of the water out-



Inside Sealab 3—side view



Sealab III

side pushes out the gas in the holes and pushes the suit on to the diver's body.

The Conshelf III divers wore different suits. Inside their suits they had glass bubbles full of carbon dioxide (CO_2). So, the pressure could not push their suits on to their bodies. But these suits were not very comfortable and the aquanauts could not easily move about in them. Divers now use electricity to warm their diving suits.

In houses under the sea divers cannot easily understand other divers. The large amount of helium (He) in the gas in the houses changes their voices. 'When we were speaking, we made a noise like an angry Donald Duck!' said one of the aquanauts.

Eight men could work in Sealab III for 12 days, 185 metres down.

People can also have a holiday under the sea! Five American women have

*Tektite II—a
place for a
holiday?*

already had a 'summer holiday' on the ocean floor. They lived in Tektite II, the U.S. Navy's newest underwater house. Peggy Lucas was one of these women and she describes life in their underwater holiday home.

