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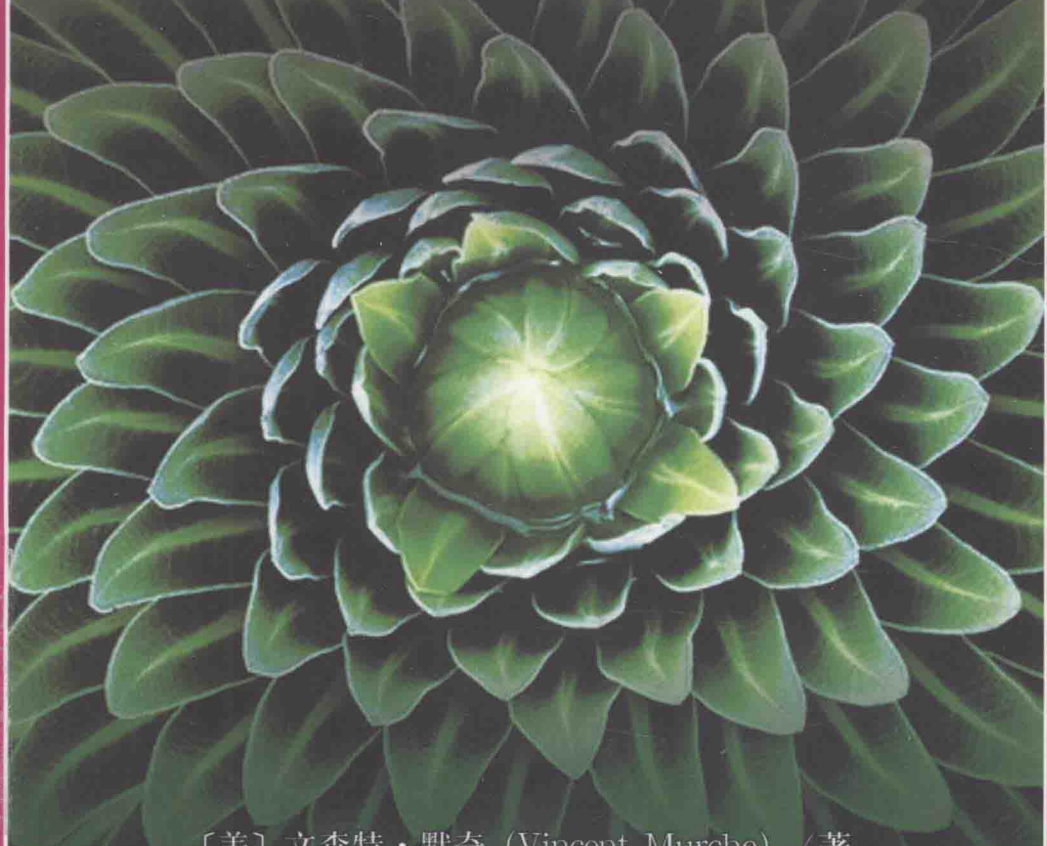
SCIENCE READERS

科学读本 1



〔美〕文森特·默奇（Vincent Murche）/著

天津出版传媒集团
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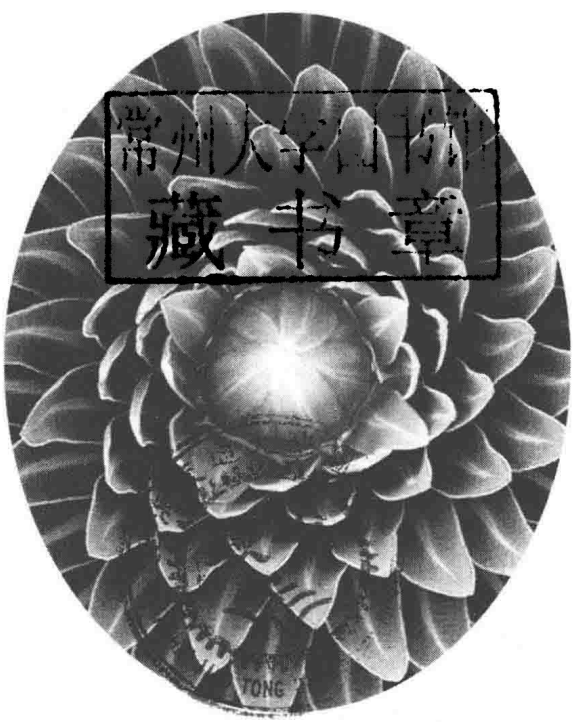

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Reading enables us to see with the keenest eyes, to hear with the finest ears, and listen to the sweetest voices of all time.

—James Russell Lowell

Foreword

This series of Science Readers was published for the use of teachers and students. It will be found useful, not only in those schools in which Elementary Science is taken as a class subject, but also for the purposes of an ordinary reader.

Of this series of Science Readers, Books I, II, and III are adapted to pupils who are in their third and fourth years of school work. Both the reading and the subject matter of Books IV, V, and VI are suitable for Senior Grades.

It is hoped that the young readers who follow them through these lessons will catch something of the enthusiasm and earnestness which characterize them as they advance step by step from very small beginnings to a real understanding of the elementary facts of natural science.

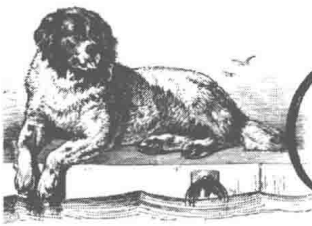
The subject matter in this volume is intended for higher level students, and includes not only a more in-depth study of the natural sciences, but also attempts to inform the student as to the connection between scientific advances and economic growth.

At the time of this series' original publication, economic matters were often discussed in British standards; therefore, the student will find that in the later volumes of the Elementary Science Readers, British economics and manufactures are discussed quite frequently. This held true even for the American students who originally used

these readers as a textbook to accompany their Elementary Science class studies.

Furthermore, in the nineteenth and early twentieth centuries, hunting, fur-and ivory-trading, and deforestation had become highly developed industries of commerce, to the point where rampant and indiscriminate activities had caused great devastation to the natural world. In modern times, we seek to conserve the natural world, and have put in place protection and preservation laws that are respected and strongly adhered to around the globe; therefore, the reader must approach the lessons dealing with this subject matter with an open mind, and an understanding that this type of activity, while unfortunate, remains a part of history and should be addressed as such.

In spite of some of the inevitable discrepancies between the modern world and the one in which this series was originally published, these science readers remain an excellent source of knowledge of the fundamental facts of the natural sciences, and the enthusiasm and earnestness which characterize these lessons are sure to draw the reader in.



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Lesson 01

Water

Fred and his cousin Willie were two smart boys in the same class at school. They were only little boys, but they were fond of their school and their lessons.

They used to play at school in the evening with Fred's little sister Norah.

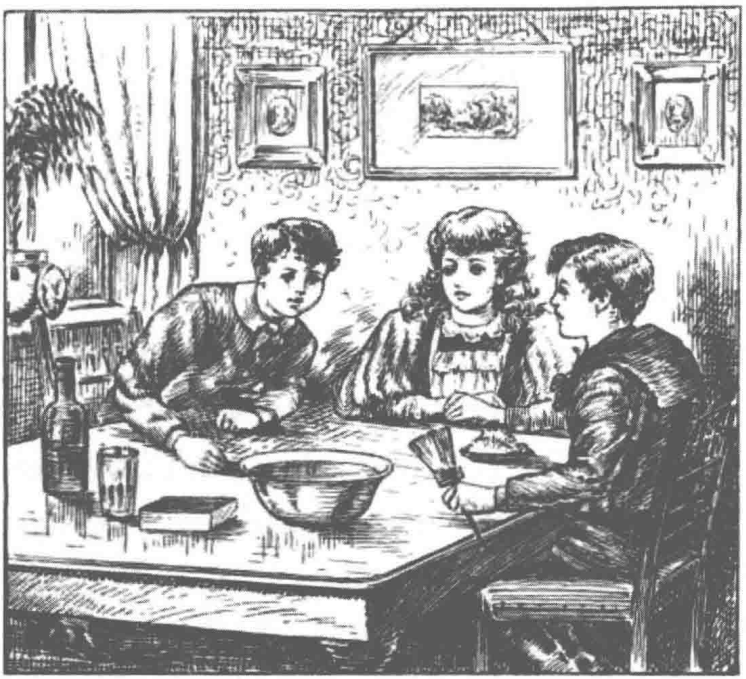
Their teacher was giving the class jolly lessons on some of the common things around them. These were not at all like the other lessons of the day. Teacher gave them to the class as a treat. The boys soon began to look forward to them, as the best of all their lessons.

Norah, too, liked to hear all about them from the boys. It was great fun to sit around the fire in the evening, and chat over the lessons of the day.

The first lesson was about water.

"What do you think, Norah?" said Fred one evening. "Teacher began to talk to us about water, by showing us a saucer full of sawdust.

"He piled up the sawdust in a heap in the saucer, and then tried to do the same with some water in another saucer."



"But, of course, he couldn't do it," said Willie, "because you can't make water stand up in a heap. It always keeps a flat or level surface."

"Yes; and, when it got to the top of the saucer, it ran away over the sides, and on to the table," added Fred. "We saw it flow along the table, and fall down to the ground."

"Why, of course," said Norah, "water always flows down. We can see it flow down, if we turn on the tap. It never flows up."

"Teacher told us to think of the rain, too," said Willie. "The drops of rain always fall down—never up."

"I can show you some drops of water." said Fred. "Look; I dip this brush in the water, and shake it. The water will fall from the brush in little round drops."

SUMMARY

We cannot pile up water in a heap; it always keeps a level surface. Water breaks up into little drops, and flows about. Water always flows down.

Lesson 02

Water—A Liquid

Norah's mother called her away to mind the baby, before the boys had told her all about their lesson.

She came back as soon as she could, and they began to chat again.

"I wonder whether Norah forgets what we learned about water," said Fred.

"No," said Norah, "I don't forget. I know that water flows, and it always flows down. It keeps a flat surface, and it cannot stand in a heap. It breaks up into round drops, but the drops will run together again, and make a pool of water."

"Quite right," said Fred. "But now I'm going to puzzle you. Can you tell me what shape water is?

"Teacher tried to puzzle us; didn't he, Will? But he soon made it clear. He showed us the saucer, and we saw that it was round. Then he filled it with water, and of course it was easy to see that the water in the saucer was round too."

"But the water did not remain round," said Willie, "for teacher next poured it out of the saucer into a square tin box."

"I know." said Norah, "it became square then, like the box."

"Right," replied Fred, "and then we saw the water poured out of the box into a tumbler; out of the tumbler into a jug; out of the jug into a bottle. It took the shape of the new vessel each time.

"Can you think of any other things, Norah, that would do as water does?"

"I know some," said Norah. "Milk and oil, vinegar and tea would do the same."

"Now, Norah," said both boys at once, "you must try not to forget the proper name for all these things. Teacher tells us to call them liquids.

"Liquids flow about, break up into drops, take the shape of the vessel which holds them, and cannot stand in a heap, but always keep a level surface."

SUMMARY

Water has no shape of its own. It always takes the shape of the vessel which holds it. Water, milk, oil, and vinegar are liquids.

Lesson 03

Solids

"You know what happens, Norah, when I pour water on the table."

"Oh yes,"replied Norah; "it flows about, because it is a liquid."

"Now I will put this stone on the table. Will the stone flow away too?"

"No," said Norah, "it will stand where you place it."

"Then would it be right to call the stone a liquid?" said Fred.

"No, it cannot be a liquid, for all liquids flow."

"We know we can't pick up water," said Fred. "It would run through our fingers, and fall in drops on the floor.

"But we can pick up the stone without spilling any of it."

"Yes," said Willie, "and we might shake the stone ever so long, but we could not shake drops from it, as we did from the water in the brush."

"I say, Will," said Fred, "wasn't it funny when

teacher shook the saw-dust into the basin, and asked one of the boys to pick out the piece of wood?"

"Yes," said Will, "but there was no piece of wood in the basin, for the little bits of saw-dust do not run together, as the drops of water do."

"I think," said Norah, "I can tell you something else. Water and all other liquids have no proper shape. But if we look at this stone, this brick, or this piece of wood, we can see that each of them has a shape of its own."

"We know that, when we put some water into the basin, it spreads out to fill it," said Fred.

"Yes," said Norah, "it takes the shape of the basin, and it keeps a level surface."

"Now watch, while I put this brick into the basin. Does it spread out to fill the basin, Norah?"

"No," said Norah.

"Does it take the shape of the basin?"

"No."

"Teacher gave us the proper name for things like the brick and the piece of wood," said Willie. "We call them solids.

"Solids are bodies that do not flow, do not break up into drops, have a shape of their own, and do not take the shape of the vessel which holds them."

SUMMARY

Solids do not flow about, and do not fall away in drops, as water does. They do not take the shape of the vessels which hold them, but have a shape of their own.