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AN INTRODUCTION TO GEOGRAPHY

1. Sun and Shadow

1. "See how far I can cast my shadow, when the sun rises," said a fine tall poplar to some smaller trees near by.

2. "The sun will be up in five minutes, and then, I warrant, I shall cast my shadow farther than any of you. Why, it goes all the way across the lawn, right up to the house, and that's a very long way, isn't it?"

3. "I don't see anything clever about that," said a meek little apple-tree. "It isn't *your* doing; it is the sun that does it. *You* only stand in the sun's light, and of course your shadow is on the ground, because the sun can't shine through you, since you are so dense."

4. "Dear me!" said the good-natured poplar, "I never thought of that; I always thought that *I* did it."

5. And the poplar laughed so, and shook his leaves so merrily, just as the sun rose up, and a gentle breeze began to blow, that his shadow

danced and glittered in the dew-covered grass. Then all the birds began to sing, and everything was very bright and merry.

6. "But I should like to know," continued the poplar, "whether the apple-tree is right. I have never really tried to cast my shadow, when the sun isn't shining; but I believe that I could do it just the same, if I liked, whether the sun were shining or not. I'll show you, as soon as I get a chance."

7. At this, the sun himself joined in the laughter, and shone out more brilliantly. Then, just to humour the good-natured poplar, a cloud put itself over the sun's face. Of course the shadows of the poplar, and the apple-tree, and of all the rest of them disappeared at once.

8. "Dear me!" said the poplar, "my shadow is gone; every bit of it! But, now, see if I can't make another one." He stood as upright, and spread out his leaves as much as he could, while all the trees stretched themselves to see the shadow; but there was none to see.

9. He exerted himself to the utmost; but not the least sign of a shadow of the poplar-tree appeared, though he tried for fully five minutes.

But then the sun burst out again with a merrier laugh than ever, which the trees all took up, as the breeze came in once again among them.

10. The poplar joined in too, for he was a very good-tempered tree. He shook and rocked him-

self from side to side till his leaves quite rustled with delight.

11. "I never should have thought it," said he; "but that is, perhaps, because I never thought about it at all. Of course, we cannot cast shadows either across the lawn or in any other direction, unless the sun is shining." And he laughed, and rocked himself more than ever, until his great long shadow on the lawn actually seemed to be laughing too.

---

2. Direction
The Four "Cardinal Points"

1. "I could have proved to you all," said a sharp gooseberry bush, "that our shadows are not made by anything that we do. That would have saved the dear old poplar-tree from showing himself such a stupid."

2. "I always thought there was something very sharp about *you*," replied the poplar, with something like a chuckle, "for I have often seen the children almost laugh and cry at the same time, when they had to do with you.

3. "They laughed because they got your berries, and cried because your sharp thorns scratched them. Ha, ha, ha! isn't it so?"

"Don't take any notice of him," said the

gooseberry bush, rather nettled; "he cannot reason a bit. His own shadow has got almost as much sense as he has.

4. "I was going to say this, that we should not have any shadows at all, if we did not prevent the light of the sun from falling in certain directions on the ground. The poplar-tree ought to have known that.

5. "But this is my proof, that it is the sun that makes the shadows. The sun is in the east just now, isn't he? He rises in the east."

"Of course he is now in the east," they all said; "he couldn't be anywhere else, when he rises."

6. "Well, and in what direction is the poplar-tree's long shadow now thrown?"

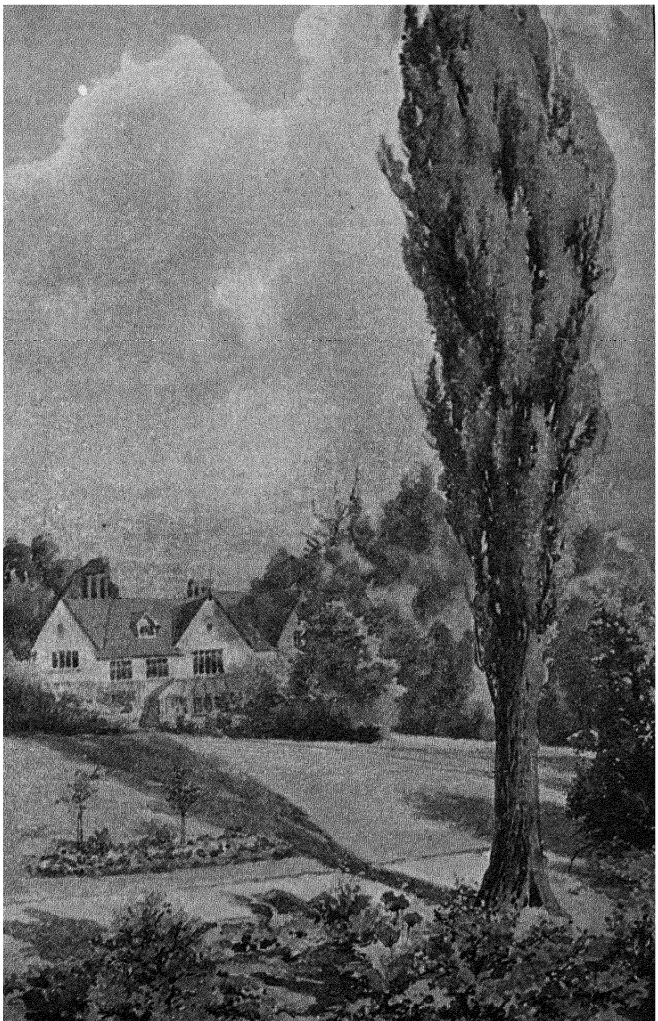
"Why, to the west," said the apple-tree. "The house is west of us, and the shadow reaches as far as the house."

"To be sure," they all said; "certainly the poplar's shadow falls to the west."

"Isn't that because the sun is now in the east? Of course it is.

7. "Now, I should have thought that the tall poplar would have seen his own shadow creep slowly round,—every day when the sun is shining, like the hand of the clock in the church tower.

8. "But he could not have noticed that, or else, he would have seen, that while his shadow



THE LONG SHADOW OF THE POPLAR-TREE (Morning)

(M774)

B

From a photograph by W. Plumbe, Maidenhead

MARLOW LOCK, UPPER THAMES (see page 68)

is creeping round towards the north, the sun is always moving more and more to the south.

"Of course our shadows turn from west to north, because the sun goes from east to south.

9. "But what can you expect of a tree who is so tall, that his thoughts are bound to be more in the clouds, than anywhere else?

"Then we have noticed, have we not? that when the sun is exactly in the south, the poplar-tree's shadow points exactly to the north.

10. "But the sun doesn't stop, even for a moment. We cannot see him moving, but he goes on, and on, after he has reached the south. Then the poplar's shadow, and of course all our shadows, point to the east, because the sun has reached the west, exactly opposite to where he was, when he rose. Then he sets behind the house in the west.

11. "And so our shadows point WEST, in the morning, NORTH, in the middle of the day, and EAST, in the evening, because the sun travels from east to south and then to the west. The sun is never in the north, in this part of the world, so our shadows never point south.

12. "I have mentioned the four chief points of direction, men call them the Cardinal Points —NORTH, EAST, SOUTH, and WEST. I do think, the poplar-tree ought to have more thought."

13. "Oh, what a lecture!" said the poplar, as he shook once again with merriment, in which

all the other trees joined. But they spent the rest of that day in watching the shadows, to see if the gooseberry bush was right.

---

3. When the Sun is in the South

1. On the day following the argument of the trees, and the lecture by the gooseberry bush, there came out of the house, at the west end of the big lawn, a boy and girl. They ran about, and shouted, and then raced, to see who could get to the big poplar-tree first.

2. "Bravo!" said the poplar, actually clapping his branches together in the breeze. "Bravo, Madge! you beat Harry that time; but then he tumbled down, and that is just like him."

3. The children never seemed to hear what the poplar said, but they loved him all the same, and nothing pleased him so much, as to hear them talk.

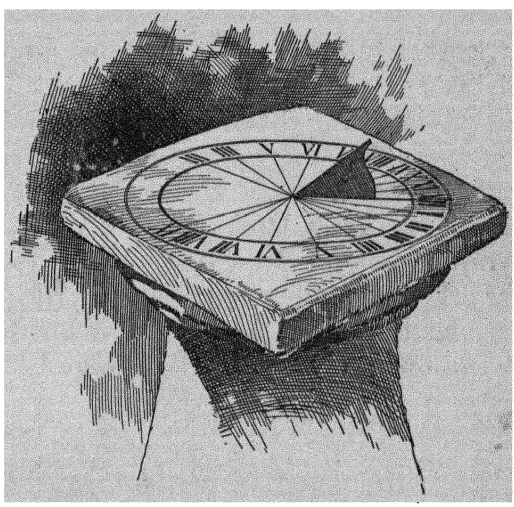
4. "I say, Madge, I can tell when it is twelve o'clock by the sun-dial." There was a sun-dial in the middle of the lawn.

"Oh, can you really?" said Madge, who thought her brother the cleverest person in the world. "Can you really, Harry?"

5. "I am sure I can," replied Harry; "you come, and see." Of course Madge went, with her eyes wider open than ever.

6. "Do you see," continued Harry, "that the sun-dial has got a face something like the face of a clock? There is XII in the right place, and other figures as well, but they don't go all round.

7. "And do you see this brass rod sticking up, and the shadow of it just a little on the XI side



The Sun-dial

of the XII? Well, when the shadow of the rod falls exactly on the XII, then it is twelve o'clock."

"Oh, how wonderful!" said Madge.

8. "It isn't wonderful, Madge. Dad says it is twelve when the sun is in the south, and that this brass rod casts a shadow on the XII, because it is placed exactly south of that number.

9. "Let us go and see the time by the church

clock;" and away they scampered to the poplar-tree again. From there, they could see the church clock, and the time was ten minutes to twelve.

10. Away they ran back again to the dial, fearing that the shadow might get to the XII before they arrived. But they had to wait ten minutes. What a time it seemed, just because they had to wait!

11. But at last the shadow touched the XII, and then they once more ran to see the church clock, and its hands were at XII too.

"Hurrah!" shouted Harry.

"Hurrah!" shouted Madge.

"Hurrah!" shouted the trees as the wind blew stronger than ever, and the dear old poplar laughed and creaked as he rocked to and fro.

---

4. The North Pole Star

1. "But I can tell you something more!" said Harry, rather proud of remembering what his father had told him. "I can tell you how to find east and west, and all about the north!"

2. "Oh, Harry!"

"Yes, of course I can! Why, look here! Now that we are at the sun-dial again, which is south, Madge?"

"Well, I should think I know that," said

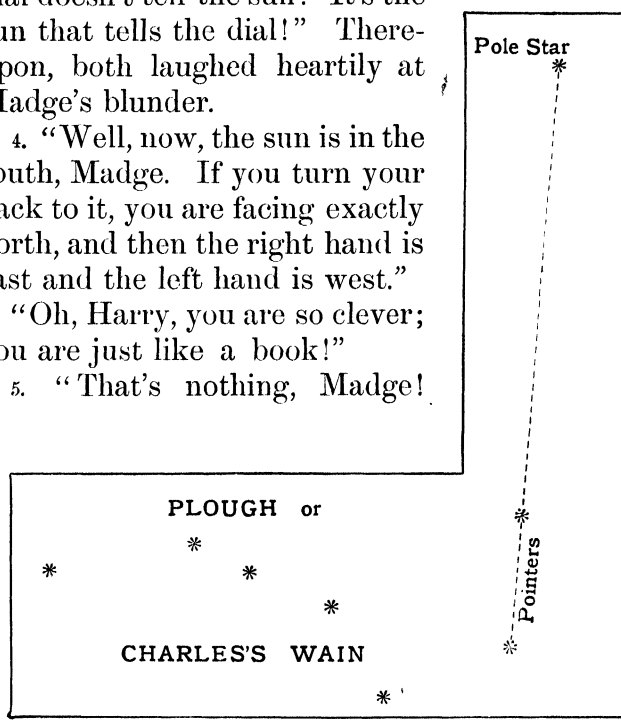
Madge. "If the sun is in the south at twelve o'clock it is in the south now, isn't it? The sun-dial tells the sun when it is twelve."

3. "It's the other way round, Madge! The dial doesn't tell the sun! It's the sun that tells the dial!" Thereupon, both laughed heartily at Madge's blunder.

4. "Well, now, the sun is in the south, Madge. If you turn your back to it, you are facing exactly north, and then the right hand is east and the left hand is west."

"Oh, Harry, you are so clever; you are just like a book!"

5. "That's nothing, Madge!



that isn't as clever as I *could* be! Why, I can tell you how to find the north when there isn't any sun at all; when it is quite dark, and only the stars are out!

6. "Now, you listen to this, Madge: but I'm afraid you can't understand. When the stars are all out, I can show you a group of seven stars which Dad says is called 'Charles's Wain'."

7. "What is a wain, Harry?" asked Madge.

"A wain is another name for a wagon!" said Harry; "but I thought the stars looked more like a plough. I told Dad so, and he said that people often called them 'The Plough'."

8. "I can't see how a plough can tell you how to find the north," said Madge.

"Ah, you have a great deal to learn yet," said Harry, with a superior air; "you listen to me, and I'll tell you.

9. "Well, two stars in the Plough point to a smaller star, a good way off, and that star is called the 'North Pole Star'. That star never seems to move, while all the others seem to go right round it."

10. "Oh! Harry, that is more wonderful than ever!"

"Yes," said Harry, "I believe that is a little wonderful; but don't you see, Madge, when anybody can pick out the right star, why, then they know exactly which is north. Then, of course, they know which is south and east and west."

11. "Ah! many and many a night," said the dear old poplar-tree, "have I watched the Wain turn round the north-pole star, and often have I thought of the wonderful guide that star must

be to ships and to travellers. But that boy Harry is a clever one! I really would give half my height to know as much as he does."

12. And, then, the wind swept by with such a gust, that Madge's hat went spinning along the lawn. The children darted after it, and their voices broke out like a laughing song. Then the trees took it up, in what seemed to be a jolly chorus.

---

5. A Wonderful Discovery—The Magnetic Needle

1. Once upon a time!—but this isn't a fairy-tale, although that is how fairy-tales begin; this is all truth.

Once upon a time men had to guide their ships over the seas entirely by the aid of the sun in the daytime, and by the stars at night.

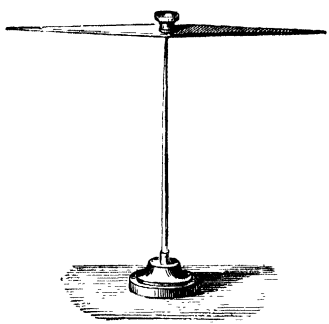
2. That was not so difficult, when there were no clouds to hide the sun and the stars. When, however, the clouds hid the sun by day and the stars at night, the mariner did not know which way to guide his ship.

3. Nowadays, sailors have something that will guide the ships as well in the night, as in the daytime, and whether the stars and the sun can be seen, or not.

4. The thing, which is so useful in guiding

them in the right direction, is only a thin strip of steel, which always turns one end toward the north.

5. The fact, that it does always point north, makes this magnetic needle, as it is called, very useful to mariners, for by day and by night they feel sure they can rely on it.



Magnetic Needle

6. Wonderful and useful as the magnetic needle is, no one knows by whom its properties were discovered. Some say, that it was brought into Europe, from China, in the thirteenth century.

7. For a long time after it was known in Europe, mariners were still afraid to venture very far away from the land. So the great oceans were almost unknown to them.

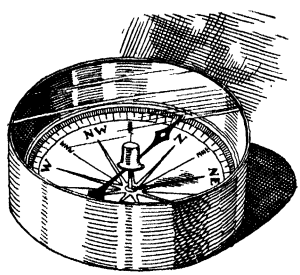
8. But in the middle of the fifteenth century (that is about 1450), the merchant sailors of Portugal, Spain, and other countries wished to find their way by sea to what is now our great Empire of India. To trade overland was so very expensive, and so very risky.

9. Some thought they could find India by sailing to the east, and time after time they tried to find it in that direction. The voyage was so long

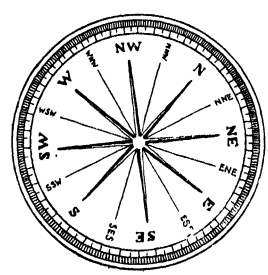
and dangerous, that for years they did not succeed.

But there was a brave mariner, whose name was Columbus, and he said he was sure that, if he went across the big ocean westward, he would at last come to India.

10. He was brave enough to venture upon that great and unknown sea, because, he was wise



Pocket-compass



Compass-card

enough, to trust himself to the guidance of the wonderful magnetic needle.

The magnetic needle had been made into what we now call the Mariner's Compass.

11. The mariner's compass is an arrangement of the magnetic needle, so that it can turn in a circular box; and on a card over the needle the points of the compass, N. E. S. and W., are shown. The N on the card is over that end of the needle which points north.

12. The card shows many other points besides the four cardinal ones, so that a ship can easily

be steered in any direction. For instance, the point half-way between N. and E. is marked N.E., which means north-east. Altogether, there are thirty-two points on the card, and, when a sailor knows them all, he is said to be able to "box the compass".

13. By the aid of this needle Columbus sailed westward over the great sea. For weeks, and even months, he continued his lonely journey, knowing always that he was going westward, because his good ship's compass showed him so clearly.

14. At length, he came to what he thought were islands of the East Indies. He named them "The Indies"; and they are known as the West Indies to this day.

It was not India but America which Columbus had discovered, and that was in the year 1492.

---

6. The Gilded Needle—A Fable

1. "I wonder what use you are?" said the needle of a mariner's compass to the lines and letters, that were arranged, in the shape of a star, above him. "You are no good to me, or to anybody else, so far as I can see. I know quite well where the north is without your help. I consider it an insult, that you are put here at all."

2. Now, the needle had just been gilded at one

end, and the nautical-instrument maker was adjusting him, and giving the glass a final polish. The needle was so proud of his gilt tip that he flew round this way and that, in quite a conceited manner, just in order to show how his gilt could glitter.

3. "The idea! as if I were a baby, and couldn't tell north and south and east and west without the aid of lines and letters! Why, I cannot go to sleep without knowing, all the time, where the north is, for I lie with my gilded end pointing to the north, and I am the only part of this compass, that is thought worthy to wear gilt.

4. "Pooh, it is quite ridiculous! Of course my other end points south without having a great S stuck there; and, of course, I turn in a circle, without the help of a round box, and circles on paper!

5. "It is really quite offensive, not to be allowed to work in my own way! But, in any case, I do not take the slightest notice of you: I turn and twist just as I think proper. I do not mean to be beholden to anybody."

6. "What do you think of that?" said N to the rest of the letters. "That needle is so conceited, with his gilt coat, and the duty which he has to perform, that he thinks he was made, and magnetized, and placed in this beautifully-made home of ours, for his own pleasure.

7. "We know, what *we* are for, and are thankful,

that we can be of use to someone. Why, by our aid, although we do nothing else than keep our places, the mariner can guide his ship exactly where he wants to go. I would rather be a plain black letter, any day, than a gilded needle, that does not know his proper place."

8. At this, there was quite a cheer from all the letters. This was still going on, when a ship's captain came into the workshop, and, taking up the very same compass, began to examine it.

9. The gilded needle was, however, in such a passion at the rebuke which the letters had given him, that he flew round and round, till the letters felt quite giddy. Then the needle, in sheer temper, dug his gilded point into the paper of the star-shaped chart, and so could not move at all.

10. "Dear me," said the ship-captain to the instrument maker, "there is something wrong with this; the needle is fixed, and in a wrong position."

11. "What a remarkable thing," said the instrument maker; "the needle has not been adjusted more than a quarter of an hour, but it certainly has gone wrong. I had better put another one in its place. There, sir, this one is all right, it behaves splendidly."

12. "Yes," said the sea-captain, "I will take the compass now," and so he did.

The instrument maker took up the bad-tempered needle, and threw it among a lot of odds and ends. Then, the needle shed many a tear of repentance for his foolish behaviour.

13. He could not tell then, where the north was, for he was not able to move at all. The other things often heard him lamenting to himself: "Oh, I wish I had only been content to do my duty. I might then have been happy, and useful; but now I am altogether useless, and my beautiful gilt is all a red, red rust."

---

7. The Use of a Map

1. In the days when sailors were learning their way about the world, and finding new countries, the maps they made were very quaint and interesting. Besides the shapes of countries, they drew on them all sorts of curious things, to let people at home know, what strange sights there were in far-off lands, and seas.

2. On a map of those times—about 400 years ago—you might see dragons, and elephants, whales fighting with sharks, ships, islands with palm-trees, and apes climbing up them. Along with many beasts that were real, there were others that were only imaginary, like the dragons.

3. But, nowadays, a map is not nearly so lively. It is chiefly intended to show the shape and the

size of countries, and the names of places in them. Nothing brightens it up, but the various colours used for different countries, or, it may be, counties.

4. Let us look at a map of England, and learn a little of what it is meant to show. In the corner is a tiny line, perhaps a couple of inches long, divided into equal parts. Each part represents a length of several miles.

5. That line is called a scale, and if an inch of it represents 10 miles, then every inch, measured on any part of the map, represents a distance of 10 miles. By drawing maps to a scale, we can show the size of large countries, even on small pieces of paper.

6. A map of England, drawn to a scale of 100 miles to an inch, would only fill up part of the page of a reading-book. Change the scale to an inch for 5 miles, and you will have a map larger than those hanging on the walls of a school.

7. The shape of a country can be seen at a glance. England is, in shape, something like a triangle; and it is nearly surrounded by the sea. The land that borders on the sea—that is, the coast—is marked on maps by an irregular line, that winds in and out, just as the coast does.

8. But every mark on a map has its meaning. The positions of towns are marked by little dots or circles. This alone is enough to show us, on

ENGLAND & WALES.
English Miles
0 20 40 60
SCOTLAND
IRELAND
Berwick
Holy I.
R. Tweed
Cheviot Hills
Newcastle
R. Tyne
Carlisle
Solway Firth
Cumbrian Mountains
Cross Fell
R. Tees
St. Bees Hd.
Scawfell
Pennine Chain
N E R
M R
L & N W R
Yorkshire Moors
NORTH SEA
I. of Man
Flamborough Head
Bridlington Bay
York
Morecambe Bay
Leeds
Hull
IRISH SEA
R. Ribble
Bradford
R. Ouse
Gt. Ormes Hd
Liverpool
Manchester
Spurn Hd.
R. Humber
I. of Anglesea
R. Mersey
Sheffield
R. Trent
Menai Strait
Bangor
Snowdon
R. Dee
The Wash
Nottingham
Leicester
Norwich
Lowestoft Ness
G E R
Cardigan Bay
Birmingham
G N R
M R
Ouse
Aberystwith
St. Davids Hd.
Cambrian Mts.
R. Severn
L & N W R
Cambridge
G E R
R. Wye
G W R
Oxford
Milford Haven
Swansea
Carmarthen B.
Worms Hd.
Cardiff
Bristol
G W R
R. Thames
London
Mth. of the Thames
N. Foreland
Bristol Channel
S E & C R
Canterbury
S. Foreland
Lundy I.
Hartland Pt.
L & S W R
Winchester
R. Exe
S W R
Exeter
Portsmouth
Dungeness
Str. of Dover
R. Tamar
Plymouth
Tor Bay
R. Avon
I. of Wight
Beachy Hd.
G W R
Portland Bill
The Needles
Plymouth Sound
Start Pt.
CHANNEL
Falmouth Harb.
The Lizard
Lands End
ENGLISH
FRANCE

what a small scale maps are usually drawn, for we know, that towns consist of hundreds of houses, and great numbers of people live in them.

9. Rivers are marked by wavy lines, which show how they wind in and out. Yet, we must remember, that each of these wavy lines stands for a stream of water, that flows between woods and meadows, past little villages, and through big towns.

10. Mountains and hills are shown by thick lines, or by a great number of little lines side by side. Railways are shown by lines joining the different towns through which they run.

11. The names of towns, rivers, and mountains are printed on the map. By measuring the distance between any two of the towns, and comparing it with the scale, we can find how far they are apart. But this distance is only "as the crow flies", as we say: that is, in a straight line. The road between two places usually winds about a good deal.

12. The top of a map is called the north, the bottom of it is the south, the right-hand side is the east, and the left-hand side the west.

BALLOON VIEW OF A RIVER, FROM ITS SOURCE TO THE SEA

SEVEN SPRINGS, THE SOURCE OF THE THAMES

8. Rivers—What they are

1. Harry had a map to study one day; but he could not go out with it, and sit under the poplar-tree, as he did when it was fine. The rain was coming down very fast, and it was dripping off the trees and running in little streams down the garden paths. So, as he was obliged to keep indoors, he began to talk to Madge.

2. "I say, Madge, if you don't talk too much, you may see how I learn all about the rivers in England. Do you see this map of England?"

"Yes, Harry."

"Well, all these marks like branches of trees are for rivers. I have got to learn for my lesson to-day all the *rivers* in England.

3. "Now, I don't suppose *you* know what a river is, Madge?"

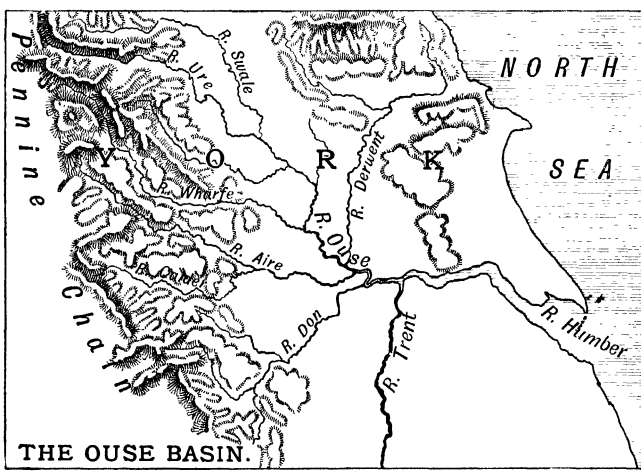
"Oh, yes, I do, Harry, a river is a—a—why, a *river*, isn't it? It is water, anyway."

4. "You are right *so far*, Madge. A river is a stream of water that rises in the land and flows into another river, or into a lake; or into the sea. That is what my geography says. These are rivers on this map, and I will show you what Dad showed me.

5. "Look, he showed me this fine group of rivers in Yorkshire. Now see, Madge. There is the Swale, the Ure, the Wharfe, the Don, and

others; and these all come, if you notice, from the west, and flow more or less eastward. And there is one river which comes from the north and flows south, and that is the Derwent.

6. "Now, if you look, you can see that these



THE OUSE BASIN.

rivers join one another, and that they all run into a bigger river, the Yorkshire Ouse.

"Then you see that this river Ouse, into which all the others run, runs itself into a much wider river.

7. "That is called the Humber, and it also receives the Trent, this big river flowing northwards from the middle of England. The Humber goes on to the sea."

"Dear me," said Madge, "do the rivers run into the sea?"

8. "Of course they do. Why, didn't I just now tell you that rivers either run into other rivers, or into lakes, or into the sea?"

"May I ask you a question, Harry?" said Madge.

9. "Of course you may, Madge: and, if I can, I will answer it."

"Well, Harry, if the rivers are always running into lakes or into the sea, where does the water come from?"

10. "Well done, Madge; that is just the question I asked Dad this morning. He told me all about it, but I am afraid you will not understand. However, I will try to tell you as well as I can what I learned from Dad."

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9. What Makes the Rivers

1. "Well now, Madge, why can't I go out this morning with my map and sit under the old poplar-tree?"

"Why, because it is raining so hard, Harry."

"Yes, of course, that is the reason.

2. "But, now, do you see the rain dripping off the trees and running down the window-panes? You can hear it also running down the pipes off the roof of the house, and all down the garden paths you can see little streams. Well, it is the rain that makes the rivers."

"Oh, Harry!"

3. "Yes, it is, really. Dad said that perhaps it is raining all over England to-day; if so, see what a lot of water is falling everywhere. All the water is running off the trees, and fields, and roads into the tiny little ditches and brooks.

4. "The brooks run into bigger ones, and the bigger ones into small rivers. The small rivers run into larger ones, and the larger ones into big rivers like the Ouse, that runs into the Humber, which soon becomes a part of the sea.

5. "Let us take the big umbrella, Madge, and go, and see where the water off the garden paths runs to."

"That would be lovely, Harry!"

So out they went under the big umbrella, and ran down to the lower end of the garden.

6. There they saw that the water from the paths all collected together, and ran through a pipe into a ditch on the other side of the hedge.

The ditch was half full of water, so they ran in the direction in which the water was going.

7. Then they saw that the ditch soon ran into the village brook. The village brook was much bigger and swifter than usual, and the water was what Madge called "dirty".

But they durst not try to follow the brook down to the river, because Harry knew that the river was a very long way off.

8. So they turned back, and entered their

garden again; and the wind slammed the gate after them. As they passed the dear old poplar, he shook himself so, with laughter at their appearance, that a thousand heavy drops fell off him, and pelted the big umbrella. The children screamed with delight.

9. But just then Mary, the maid, came running out of the house, and scolded, and drove them in.

When Harry explained, why they had been out in the rain, their father said he would forgive them this time. But they had to change their socks and shoes, and promise not to go out into the wet any more.

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10. How Rivers are Made—Springs

1. "I say, Madge, I have a map of England with mountains marked on it as well as rivers. Dad said I ought to have studied the rivers more carefully first. Then I asked him what made the rivers run off the land, so he showed me the mountains. And then he said I might show you if I liked."

2. "Oh, thank you, Harry! I shall like it."

"Why, don't you see, Madge, the rivers could not run off the land if there were not mountains and hills, or at least some parts of the land higher than another."

3. "Of course," said Madge, "the water ran

down the garden paths yesterday because it is higher here than where the poplar-tree is."

4. "Well, now, you look at all these rivers of Yorkshire again. You see that most of them *rise*, that is begin, among a range of mountains that *stretches*, as Dad says, along the west side of Yorkshire.

5. "When the rain falls on the mountains or hills, it runs down their sides. Then it collects into little streams, which join together to make big ones, and these in their turn make rivers.

6. "You see, as the ground is so high, where the mountains are, the water runs and splashes down. Dad says it seems to be in a great hurry till it gets on to lower ground, and then it forms a murmuring brook, or a gently-flowing river.

7. "See how the rivers run down the valleys between the mountains, on their way to the sea; they naturally run where the land is always sloping more and more to the sea-level.

8. "Dad told me that, though a great deal of the rain runs down the sides of the hills, it doesn't all run off, in that way. Some of it sinks into the ground, until it is stopped by clay, or hard rock."

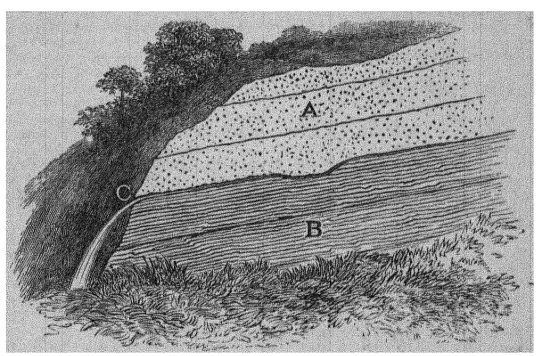
9. "Does it go far down, Harry?"

"Ever so far sometimes, Madge! but it doesn't always stop there."

"Oh, I know, Harry!" said Madge eagerly. "It runs into wells like the one that Farmer Jones made last year."

10. "Very good, Madge; you are getting quite clever. Dad says, though, that the water deep down in the mountains doesn't wait for wells to be dug. When it cannot sink any lower it forces its way out through the side of the mountain."

11. "Why, that must be a spring, Harry, like the one, at the foot of the hill, behind our



Hillside cut through, showing how a Spring is made

A, The upper part of the hill through which the rain-water passes. B, The clay below, through which the water cannot pass, and upon which it flows to, C, The spring, or place where the water breaks forth from the hill.

garden." And Madge jumped about in delight, because she had found this out for herself.

12. "Yes, that's right, Madge. Our brook starts from that spring, and Dad told me that the great river Thames has its beginning or *source*, as he called it, in a spring no bigger than ours."

13. "Well, I never!" said the old poplar-tree, who had been listening. "I am ever so much

bigger than those two children, and I never knew that before." But he took good care to say that quietly, for he did not want the gooseberry bush to hear.

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11. Watershed

1. Madge was so pleased with what she had seen and learned, that she begged Harry to show her the mountains in England, that made the rivers run down to the sea.

2. "You see, Madge, the rivers run down to the sea from the mountains, because the mountains are very high parts of the land. They are higher than the hills—ever so many times higher than the hills, we can see from here.

3. "If we look on this map, we can see what is called a chain of mountains. It begins in the north, where England joins Scotland, and goes almost half-way down through the middle of England.

4. "This is a long stretch of mountains and hills, not arranged like soldiers in a straight line, but all very irregularly placed.

"We saw, the other day, that some rivers flow to the east from this mountain range, and some flow, from it, to the west.

5. "But, what I want you to know, Madge, is what Dad explained to me; and that is, that the highest part of the land, or what is called

the ridge of a mountain chain, is known as a Watershed."

6. "That seems a hard word, Harry! but what does it mean?"

"Well, it is easy enough, when you know

what it *really* means. It only means that the ridge of land anywhere sheds the water down both its sides.

7. "It is just the same as the ridge on the top of the roof of our house, which sheds the rain

down one side to the east, and the other side to the west."

"So it does, Harry. I don't believe I shall ever forget now what a watershed is."

8. "But Dad said, that a watershed need not be a high ridge of mountains, or even of hills. It might be the highest ridge of land, in quite a low-lying part of the country."

9. "Oh, I know!" said Madge. "It might be like the roof on old Betty Brown's cottage, that we could easily climb over, and need not be like the high roof of our house."

10. "Yes, you are right, Madge. Of course the ridge of Betty Brown's low thatched cottage roof is just as much a watershed as that of the high roof on the church.

11. "There is just one difference, and that is that the rain pours off the church roof much faster than off Betty Brown's cottage. The steeper the slope, the swifter is the river."

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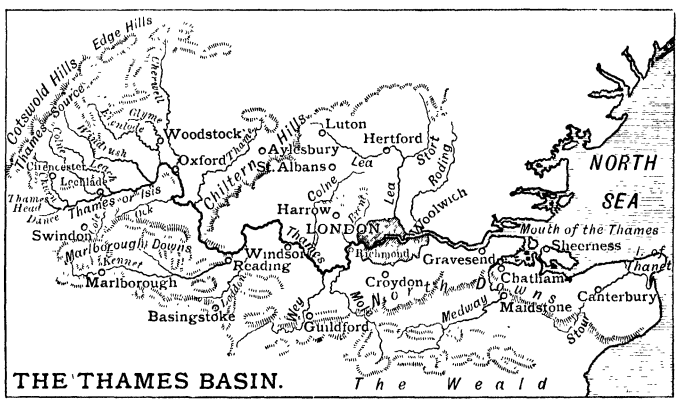
12. Tributaries and River Basins

1. Here we have a map of the River Thames, and of the land that stretches for some distance on both sides of it. The river rises, we notice, in the Cotswold Hills, and flows, mainly eastwards, till it reaches the North Sea.

2. From its *source*, or beginning, to its mouth,

or where it enters the sea, is a distance of rather more than 200 miles. If the river ran in a straight line, its length would be much less. But a river cannot go straight.

3. Sometimes a piece of high land comes in its way, and it has to dodge round it. At other



times, the land in front is rocky and hard, so the river finds it easier to worm its way through a softer part.

4. Now, we know, why a river twists about so. It is not like a canal, the bed of which is made by men. A river has to make its *bed*, or the groove in which it runs, for itself, and it does not trouble, whether its *course* is straight or crooked.

5. If we look at our map, we shall see ridges of high land on the north and south sides of the river. These are watersheds, as we can see by

the streams that run from them into the Thames.

6. These streams feed old Father Thames with their waters, and help it to widen and deepen its bed. They might well be called feeders, but the usual name is *tributaries*.

7. Kings, in olden times, used to make countries, that they conquered, pay them a yearly tax or tribute. This tribute increased the riches of the conquerors. Father Thames takes tribute from streams that are smaller than himself, and their waters add to his greatness.

8. The place, where a tributary joins the main river, is called a *confluence*. This is a name formed from two Latin words, meaning "to flow together". It is quite a suitable name, for the two rivers flow on together from that point.

9. Let us look again at the ridges of high land in the map. They stand somewhat like walls on the west, north, and south, but the east is left open. They are not quite like walls, for the land slopes gently from their tops down to the banks of the Thames.

10. The land between these ridges is, in shape, something like a trough, or dish, with one end knocked out. The streams within this dish all find their way into the Thames, which therefore drains the dish, as a gutter drains a road.

11. But we must not call it the Thames dish, though we may use a name that is similar. It is commonly called the Thames *basin*, or the

Thames valley. So you see a river has a *basin* and a *bed*, but it seems to have forgotten to provide itself with any other furniture.

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13. An Old, Old Ocean and a Tiny River

1. "I wonder what use you think *you* are in the world," said a big ocean to a little stream, which came dashing off the land into it. "It's no use your putting on airs like that. I consider it quite impudent of you to come tumbling into my waters without even asking permission."

2. "Why, what a dear stupid old ocean you are!" replied the little stream, as he laughed and swirled among the rocks, and then took a header right into the waves.

3. "Don't you know your own darling child, your own little son?" And the stream laughed and splashed and glittered so much in the sunlight, that a rainbow could not help encircling him in a loving embrace.

4. "*You* a son of *mine*!" said the old ocean, as she drew back her waves in order to have a look at him. "Well, I must say you are a pretty little stream, but how you can call yourself a son of mine, puzzles me altogether. Why, you come tumbling off the land, and all my waters are always down here, as they should be."

5. "All I can say is," replied the stream, "that it is not so very long ago since I was down here with all the rest of the waters. While we were tumbling about merrily in the summer sunshine, something caught me and carried me away up into the clouds, and took me for a journey miles and miles and miles about the world."

6. "Dear me," said the old ocean, "it must have been my friends the winds at their games again. But I never missed you!"

"No, of course you didn't, but that is because there is so much of you."

"Well, how did you get down again if you were carried up into the clouds?" asked the old ocean.

7. "The idea of our own old mother not knowing that does seem ridiculous. Did you never see it rain, you dear old ocean?"

8. "See it rain! I should think I have, millions and millions of times, but the rain isn't a stream like you. It is only little drops that make no difference at all in me."

9. "Well, I fell down as rain too," the stream went on; "but, you see, I fell on the land, and the little drops all collected together. Then they ran in a thousand tiny channels which joined together, and so I became a mountain stream and then a winding little river.

10. "And I ran in and out among hills and through long valleys, and round meadows and along by corn-fields, and then all among village

gardens. I watered the land, and made all the green things grow, and all the flowers.

11. "Sheep and cattle and horses came to drink from me. Birds took their morning bath in me, and then sang all day long on my banks.

12. "You said you wondered what good I was in the world. Why, I am a great deal more useful to the world as the rain, and as a little stream, than I am as a part of you, you dear old thing!"

13. "Well, why did you come back to me again?" said the old ocean.

"Oh, I couldn't help coming back to you. Somehow I cannot keep long away from you; but I have been over the world like that many a time before, and I have no doubt that I shall soon go over it again."

14. "I am truly sorry, you dear little stream, not to have known you again, and particularly if you really are so useful in the world."

And a great splash like big, big tears ran all along the beach.

14. On the Thames

1. "Fancy being in London, Madge, the biggest city in the world, in which, Father says, there are millions of people!"

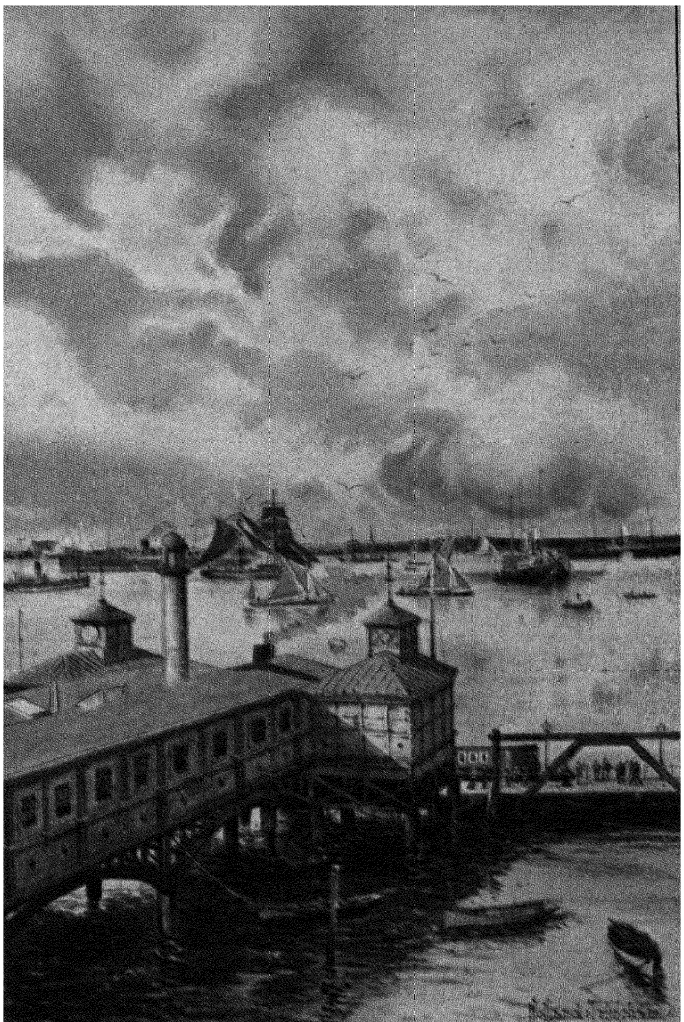
"And fancy," replied Madge, "being on a steamboat, and on the great River Thames, with Dad to take care of us!"

2. "Yes, we are going down the river, and right along the estuary into the North Sea, and on to Harwich, and then by train to Yarmouth!" Harry, for a moment, almost forgot himself. He was about to fling his hat into the air and shout hurrah, as if he were under the dear old poplar-tree, but he stopped himself just in time.

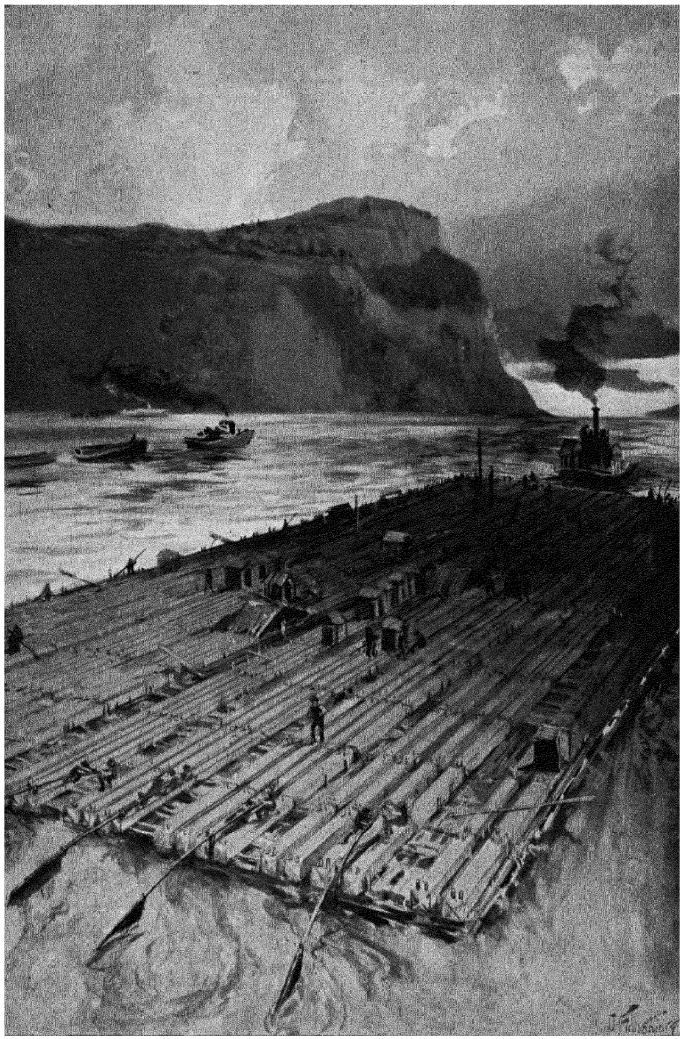
3. "Now, Dad says we are to notice everything, and I'm to tell him about what we see afterwards; so now, Madge, what do *you* see?"

4. "Oh, I see a million things, I should think! A big river, and thousands of boats and ships, and I don't know how many Towers of London, and St. Paul's Cathedrals, and London Bridges. There seem to me to be thousands of everything!"

5. "Why, what would Dad say to me, if I talked to him in that way? There is only one Tower of London; only one St. Paul's Cathedral; and only one bridge called London Bridge. But there *are* so many towers, and churches,



THE THAMES AT GRAVESEND



THE USES OF RIVERS
A Lumber Raft on the St. Lawrence

and bridges; and so many of everything, that you are not far wrong, Madge.

6. "But what I admire most, Madge, I think, is this wonderful river. Do you remember what *our* river was like when we went to see that?"

"Yes, Harry. A tree had fallen right across it, and we called it a bridge and kept crossing the river by it."

7. "And when I tumbled in, why, I just walked out again, didn't I, Madge?"

"But look at this river. Fifty ships could pass each other at the same time, I believe!"

8. "Oh, but there are bigger rivers than this in the world."

"Bigger than this?" said Madge, her eyes wide open. "Oh, Harry!"

9. "Well, Dad says so. He says that there are rivers in North America, and in India, so big that they would make the Thames look like our village brook beside them."

"Oh, Harry!" was again all that Madge could say.

10. "That is what Dad says; and when we get a chance we are to look out the American and the Indian rivers. Some are, he said, thousands of miles long. They are as many thousands as the Thames is hundreds!

11. "Even in Europe, the Danube, the Rhine, the Oder, the Elbe, and the Volga, are bigger than the Thames. I had to learn these rivers,

and you see I haven't forgotten all of them, have I, Madge?"

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15. On the Thames—Ebb and Flow

1. Harry and Madge were not only interested in what they saw, they were amazed; for there seemed to be no end to everything—no end to the shipping, no end to the grand buildings and warehouses along both banks of the river; while every now and then big ships passed them on their way to the docks.

2. But occasionally their steamer stopped at piers or "landing-places" to let passengers get off, and to take others on board.

While they were stopping at one of these piers, Madge suddenly asked of Harry: "Which way is the sea?"

3. "Well, how absurd, Madge!" replied Harry. "We are going to the sea, are we not? The steamboat is taking us there."

4. "But look at the river, Harry. The river is flowing away from the sea, then, for it is not going our way. I thought all rivers ran into the sea and not away from it."

5. "So they do, Madge; you must be mistaken." They both watched the water, and it certainly was flowing, and pretty fast too, away from the sea.

Harry stared hard at the water; but he could not understand this any more than Madge could; so he very wisely concluded that he had better ask Dad.

6. "It's all right, Harry," said his father; "the river is not running away from the sea. It is only because we are now so near to the sea's level, that the tide comes right up the river, miles away from where the sea actually is."

7. "Oh, of course," said Harry. "I have heard about the tide. It rises and falls twice in twenty-four hours, doesn't it, Dad? But what makes it rise and fall?"

"Well, Harry" (and of course Madge too was listening with all her ears), "I think we had better leave that till you are a little older.

8. "But the tide that is now coming in, is called the 'flow' or 'flood'. Before we reach Harwich you will see that the tide will be going out again. When it is going out it is called the 'ebb'.

9. "All these great ships take advantage of the flow to come up the river, because the flow inland helps to bear them along. That is why most of the ships and boats which pass us now are going up the river.

10. "When the tide 'ebbs' again, that is, flows towards the sea, then the outward-bound ships and boats will go down to the sea with it; because it helps them along towards the open sea.

11. "In most river-mouths the tide rises and

falls gradually. But there is one river in England where it rises suddenly, and runs up in a wave several feet high. A tide like that is called a Bore."

12. "What river is it, Dad?" asked Madge.

"It is the Severn, a big river in the west of England. It is a little longer than the Thames, but not so important, for it hasn't a city like London on its banks.

13. "Mind you keep your eyes open, Harry, and try and interest Madge in all that you see."

Once more Harry and Madge were left to themselves.

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16. On the Thames Estuary

1. Away went the boat one way, and London, gigantic London with its crowded and busy river, seemed to go the other. Soon the warehouses and buildings were nearly all gone, and they came to Woolwich.

2. On they went again, through miles and miles of the ever-widening river, till they came to Gravesend.

Soon after leaving Gravesend, however, the river suddenly widened out until it was several miles across. Then away out before them they saw the open sea, with some ships miles and miles distant.

3. "This must be the big estuary," whispered

Harry, who was much astonished at the great expanse of water all around him. "Don't you remember, Madge? We found on the map the wide opening of water into the land, that was called the Estuary or Mouth of the Thames."

4. "I remember, Harry," said Madge; "but fancy us being *on* it, on a real estuary!"

"Please, sir," said Harry to a man, who turned out to be a pilot, "is this the mouth of the Thames?"

5. "I should say it is, my lad," said the pilot, looking curiously at Harry. "I haven't seen any *other* river in these parts. Of course it's the Thames."

"Oh, but is it the estuary, please?"

6. "Well, young gentleman, I *don't* see how it could be anything else either. Of course it's the *estuary*—it's the estuary of the Thames; and an estuary is a 'mouth', to be sure.

7. "But you are an enquiring young gentleman, aren't you?" said he, rather pleased with Harry than otherwise.

"You see," replied Harry, "we want to know about everything; that is what we have come for, isn't it, Madge?"

8. "You don't say so!" exclaimed the pilot. "I never heard of two such chicks as you, taking a voyage down the Thames in order to make scientific observations."

"Oh, we are not scientific!" hastily said Harry.

"We are only learning what things are called in geography."

9. "Really!" said the pilot. "But I should reckon that that is the beginning of a science, anyway. Can you box the compass, young gentleman?"

"Oh no," said Harry; "but I know what a compass is."

10. "Do you, though?" said he. "Perhaps you could tell me where the south is just now."

"*I* could!" shouted Madge in a hurry. "If it is twelve o'clock the sun is in the south now."

11. "Wonderful!" said the pilot, looking at his watch. "It is twelve exactly now, and the sun *is* in the south. Since you two are so sharp, I really should like to talk to you for a bit. I am going out to bring a ship up the river, because it cannot find its way up by itself; but I have plenty of time just now."

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17. Mud-banks—Sand-banks

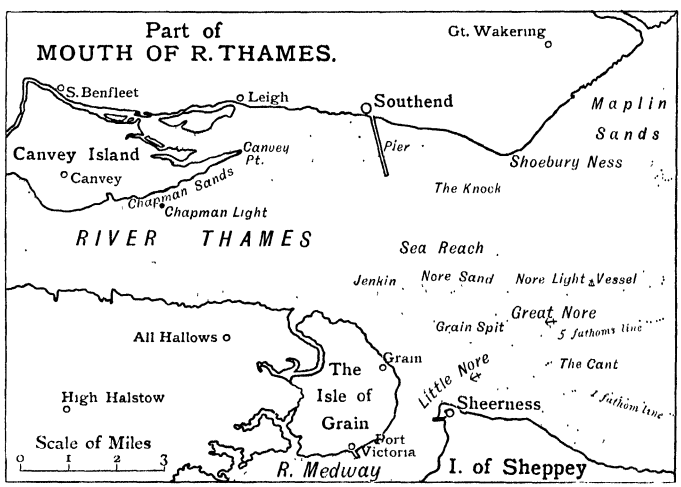
1. "If you please, Mr. Pilot, why cannot a ship come up the river by itself? I mean, without your going to bring it up? The sailors can bring it up, can't they?"

2. "If they knew the river well enough, they might; but, you see, they do not know the river. They do not know where the mud-banks, and

the sand-banks, and the shallows are. If they had not a pilot they would likely be wrecked."

3. "Wrecked!" said Harry and Madge with open eyes.

"Yes," continued the pilot; "not on rocks or cliffs here, you know, but they might stick fast



in a mud-bank, or be driven on to a sand-ridge. Then there are shallow places, where the river is not deep enough to float a ship."

4. "Dear me!" said Harry. "But there are no mud-banks and sand-ridges that I can see. It is all water everywhere."

"That is," said the pilot, "because the tide is nearly full now, and they are covered with water.

5. "But see, over there is the mast of a ship sticking out above the water. The ship is fast in a great bank of mud. Lower down the river there are banks and ridges of sand; often they are a good many miles long, and sometimes a mile or more wide.

6. "Where we are now," continued the pilot, "we have to keep in the channel between wide mud-flats, which we could see at low tide. We could easily go aground within a few hundred yards from here, although it looks like deep water."

7. "Where does all the mud and sand come from?" asked Harry.

"Oh, it comes down the river. I know the mouths or estuaries, or whatever you like to call them, of a good many rivers, but I do not know any without mud-banks or sand-banks. Some are quite impassable to big ships, because of the sand and mud."

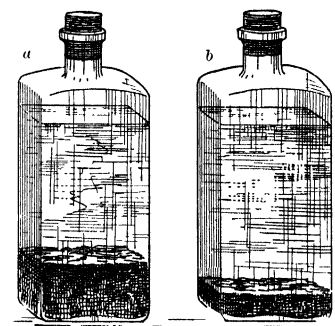
8. "Dear me!" said Harry. "And how does it come down the rivers?"

"Well, I see that you do not know everything yet, young gentleman. Did you never see a river coming down to the sea in flood? It is very big and swollen then, so that the water rushes down much more rapidly than usual.

9. "This happens when there have been heavy rains. The rains wash down earth, and clay, and sand into the streams. The streams take

it all into the river, and the river carries a great deal of it for many miles.

10. "If you were to take up some of the river water in a glass, you would see how muddy it is. Soon the mud will sink down to the bottom of the glass, because the water is no longer moving.



Water—(*a*) from River in Flood; (*b*) from River not in Flood

11. "The most likely place for a river to drop the soil it carries is at its mouth. It is at the sea-level then, and is no longer flowing downhill, so its flow is stopped and the mud settles down.

12. "If the Thames were a very big river, like the Ganges in India, it might force its way for miles out into the sea. The Ganges does so, and you can see its muddy waters discolouring the sea long before you reach its mouth."

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18. Sand-bars

1. "It is very good of you, Mr. Pilot, to tell us so much, and *I* think it very interesting; and we are much obliged to you, aren't we, Madge? But

I wonder that the sea, and the tides, and the big waves do not carry all the mud away."

2. "Why, the sea, in my opinion, is the very thing that will not have it—at least, not more of it than it can help. For as fast as the rivers bring the mud and the sand down from the land, the sea throws or carries it back again.

3. "The sea carries some of it back again for some distance into the rivers, with almost every tide. You can see the water is rather muddy now.

4. "But when there is a strong east wind driving right into the mouth of the Thames, the water is muddy indeed. The storm-tossed water disturbs the sand and the mud banks, and sometimes great portions of them are shifted from one place to another.

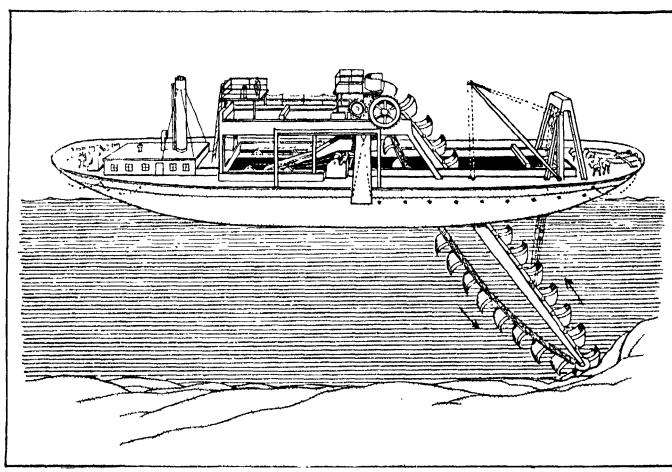
5. "We pilots have to learn where changes like that have taken place. We keep our eye on the deep channels, so as always to know the safest way to take the ships.

6. "In some places, as I have seen many a time, big ships cannot get into the mouths of the rivers at all. They have to land their cargoes in small boats, because the sea has cast up great sand-ridges right across the mouths of the rivers.

7. "Sometimes these sand-ridges are only covered with water at high tides; so you can see what a hindrance they are to ships.

"These are called Bars, and in many places even fishing-boats can only cross them at high tide."

8. "Oh, *I* should take the sand away in big



Dredger, showing the chain of buckets carrying up sand and mud from the bottom of the river

boats," said Harry. "Then the ships could get in, could they not?"

"Well, that is not a bad idea, young gentleman. It is what is done to some extent.

9. "There is a sand-bar in the mouth of the Mersey, which, as I dare say you know, is an important river in the west of England. Machines called dredgers are constantly at work on it, fetching up tons of sand. In this way the river

is kept deep enough for the great ships to come up to Liverpool."

10. "I should like to see a dredger," said Harry.

"Well, there you are!" said the pilot. "You can see one at work over there near the left bank. It has something like a long ladder, and a chain of buckets crawling up one side and down the other.

11. "Those coming up are full of sand, which they empty into a great tank as they come down the ladder."

"What is done with the sand?" enquired Harry.

"I believe some of it is sold to builders, who use it in making mortar."

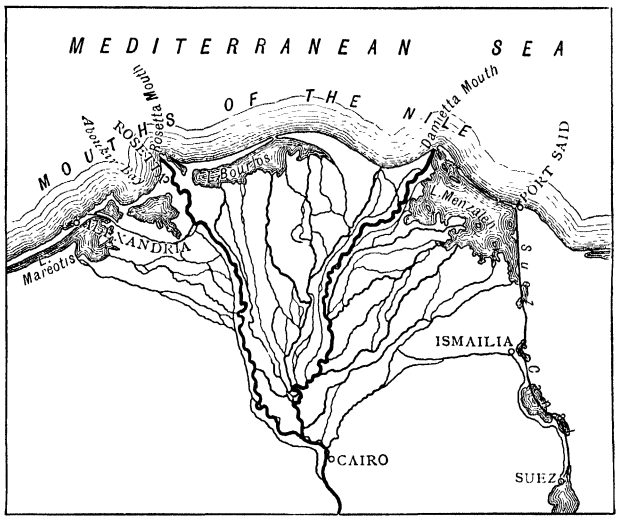
12. "Why did you call it the left bank just now?" asked Madge.

"Well, miss, that is what everybody calls it. You see, it is on our left hand as we look down the river. Of course the other bank is called the right bank, and people know that in naming the banks of a river they must always fancy themselves looking the way the river runs."

13. "Oh, thank you!" said Madge. "I think that is splendid!"

"Do you really, miss?" said the pilot, highly pleased. "Shall I tell you something more?"

"If you please!" cried Harry and Madge.



19. Deltas—I

1. "Talking about what the rivers bring down," continued the pilot, "the Thames is nothing to some rivers in the world. If they could be placed here instead of the Thames, they would soon fill up the whole of this great estuary with mud and sand and gravel, and would make dry land of it."

2. "Oh!" said Harry. "What wonderful rivers they must be!"

"Yes, so they are. In this respect, at any rate, they beat the Thames out and out; and they are many times bigger than the Thames.

3. "There is the Ganges, for instance, in India.

That river brings down to its mouth every year enough material to make quite a big mountain, if it could be all piled up in one great heap.

4. "It adds quite as much as that every year to the mud and sand which have collected at its mouth. In this way, the Ganges has formed a large level tract of land something like a triangle in shape. This is called its delta, and is covered with tall, coarse grass, reeds, and bushes.

5. "You could go, as I have gone, for several hundreds of miles along the sea edge of the delta of the Ganges. You could spend weeks and weeks going along the net-work of streams, by which the river finds its way through its own delta to the sea."

6. "But where could a river get such a lot of mud and sand and gravel from?" asked Harry again.

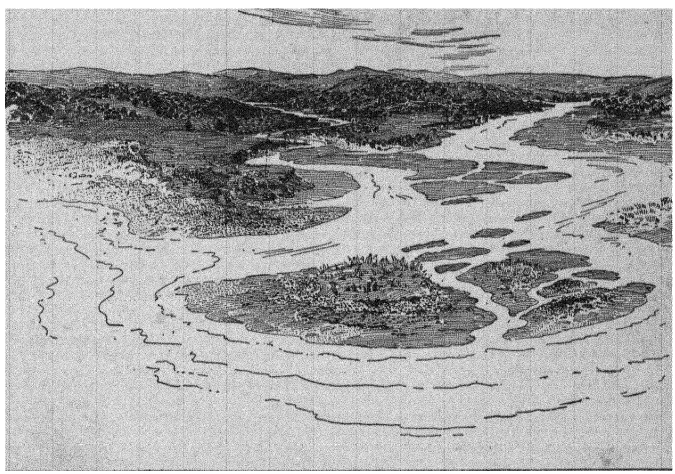
"Well, if you will take the trouble to look at a map of India, you will see that the river Ganges has some big tributaries.

7. "These run down from the slopes of the highest mountains in the world, and most of the material, of which that great delta is made, has come from the slopes of these mountains. It still continues to come down into the rivers, and to be carried down to make the delta bigger and bigger every year."

8. "Oh, I think that very interesting!" said Harry; and "I think it splendid!" said Madge.

"What other rivers are like that," said Harry, "if you don't mind telling us?"

9. "There is the Indus in India. That has a big delta too, and that river also comes down from the Himalaya Mountains. There is the



Mouth of River, showing Delta, Sand-banks, &c.

Nile in Egypt, too. You must have heard about the Nile. Its delta is as big as Wales, and the delta of the Ganges is even bigger than that.

10. "In flood-time, the Nile delta looks like a great marsh. But when the floods have gone down, the soil is very fertile. Rice, sugar-cane, cotton-plants, and other crops grow very rapidly, and sometimes there are two harvests in a year.

11. "There is a big delta, too, on the Mississippi,

a very large river in North America. Every year it gains a hundred yards in length. It is a useful delta, like that of the Nile, for enormous quantities of cotton are grown on it.

12. "Then there is the delta of the Rhine, a river in Europe. That covers a large part of Holland and Belgium.

"Fancy, the soil of that delta was once a part of the Alps, the great mountains of Switzerland."

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20. Deltas—II

1. "But, if you please," continued Harry, "are there not any deltas in England?"

"Oh yes, there are deltas, such as they are. In fact, almost every river that I know makes something like a delta at its mouth; but then, you see, it nearly always remains sand, or mud, or gravel. It does not become dry land to any large extent, like the deltas I have mentioned."

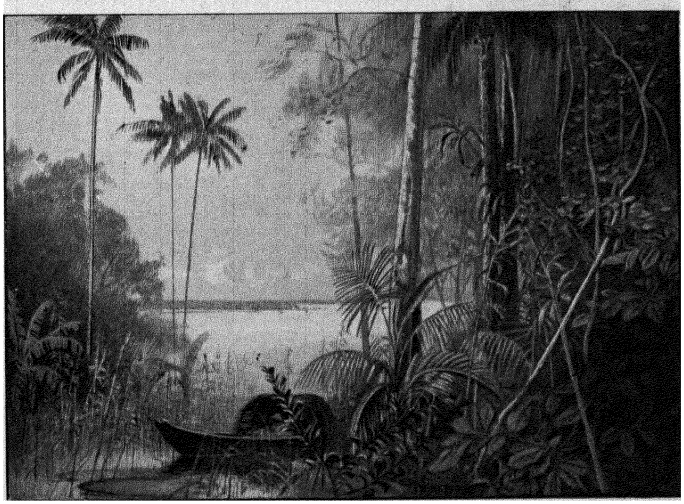
2. "But why does not the Thames build up a big delta at its mouth? Why does it not fill up this big estuary, as you said the Ganges would?"

"The Ganges would for certain," replied the pilot. "Do you remember where the Ganges and the Indus get the material with which they build up their big deltas?"

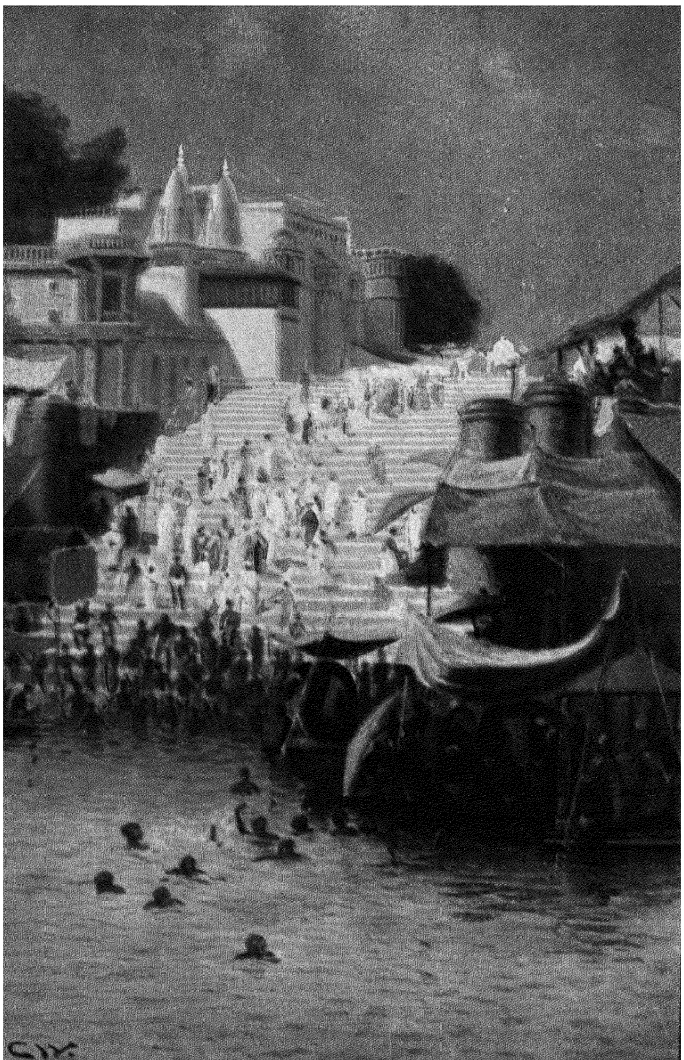
3. "Yes," said Harry; "from the highest mountains in the world, the Himalaya Mountains."

Photo. Photochrom Co. Ltd.

The Nile at Cairo



On the Bank of a Tropical River



THE GANGES AT BENARES, THE SACRED CITY

"Yes, that is it. On those high mountains very heavy rains fall, and the snow on the summits is always being added to and always melting. The rain and the melting snow bring down large quantities of broken-up and decayed rocks and earth into the streams and rivers.

4. "But if we find the Thames on the map and see where it rises, we shall find that it rises in the Cotswold Hills. These hills are only a few hundred feet in height, and are green to their very summits.

5. "Well, we could hardly expect a river that rises in such hills to form a delta like the rivers that rise in the highest mountains in the world, or even those that rise in the Alps; for the Alps are high, and there is always snow on their summits.

6. "But if we looked at almost any river in the British Isles where it enters the sea, we should there find the mud, sand, and gravel, that really are the river's delta.

7. "Very often the deltas are much bigger and more important, than one would suppose. For sometimes villages and even towns are built upon the deltas of British rivers.

8. "A part of London, for instance, is built upon what was an ancient delta of the Thames. The little town of Musselburgh, near Edinburgh, is wholly built upon the delta of the river Esk. Many similar cases might be mentioned.

9. "So our own rivers do form deltas, although we usually see them as banks of mud or sand in the sea, or in estuaries."

10. "Father will be glad to find that we have learned so much about deltas. Thank you very much, Mr. Pilot," said Madge.

"There is one thing more that I can tell you, miss," continued the pilot, "but I learned that myself from somebody else.

11. "I was told that the word *delta* is the name of a letter in the Greek alphabet which is shaped like a triangle. You can see from maps that most deltas have that shape."

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21. Uses of Rivers—I

1. If the question were asked what the chief use of rivers is, no doubt everyone would give the same answer. That answer would be, that rivers are like roads leading from one town to another, or, it may be, to the sea.

2. Rivers have other important uses, but as everyone who has seen a big river cannot help noticing the ships and barges on it, the first thought is generally that a river is like a road.

3. A deep river with a slow current is most suitable for ships. Rivers that flow rapidly, like the Tay in Scotland, are of little use for this purpose. Not only is it hard for ships to make

their way against the stream, but often the river is not deep enough.

4. Rapid rivers may have other uses. The Ottawa in Canada is very swift, and its waters are used to float millions of logs of timber down to the St. Lawrence, of which it is a tributary.

5. Again, a river may be too slow. The Seine, a large French river, runs very slowly, and the mud carried by its waters settles down, before it reaches the sea. The banks thus formed in the river are a great hindrance to navigation.

6. Even the largest rivers are often difficult to navigate. The Mississippi is several thousands of miles long, and has a tributary, the Missouri, as big as itself.

7. Great steamboats as big as ocean-going vessels ply on its waters, but they have always to carry a pilot. The pilot is constantly on the watch for sand-banks, and shallow places where the steamer might go aground.

8. He detects these generally by the colour of the water above them. But as the sand-banks shift their position from day to day, a Mississippi pilot has always to be on the alert.

9. The Thames is a good river for navigation, yet you have heard of the sand-banks in its estuary, which have to be dredged to keep them from choking up the passages for ships.

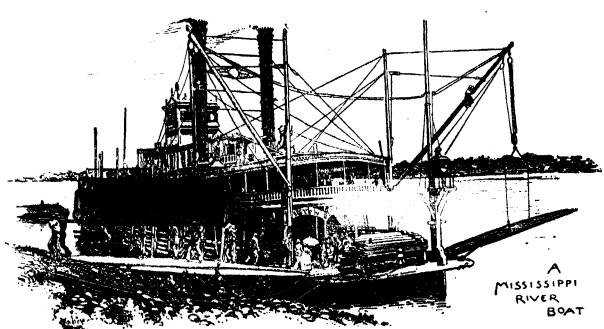
10. But further up the river there are shallow parts not deep enough for barges. These diffi-

culties are overcome by means of locks. You have perhaps seen a canal lock, and know that it is like a step or a stair in the canal.

11. The first lock in the Thames, that is, the one nearest to the sea, is at Richmond. Up to this point, about twenty miles above London Bridge, the Thames is a tidal river. Above Richmond it is more like a canal, since several locks have been made at shallow places.

12. A lock prevents the water of a river from flowing away too fast. On one side of the lock the river is higher than it is on the other. Boats coming up stream enter the lock through gates, which are then shut behind them.

13. The boats are then in a deep trough, shut in at each end. Water is let gently in from the higher level till the lock is full. Then the gates are opened, and the boats enter the higher portion of the river.



22. Uses of Rivers—II

1. Settlers in a new country always strive to place their homes near a good supply of water. That is almost the first thing they look for, since they know that life would not be worth living if water were not plentiful.

2. That is why, as you may see on maps, towns are most numerous near the banks of rivers. The map of Australia is a good example. Australia has not many rivers, and many of those it has dry up in the summer-time.

3. Yet a river of this kind is better than none at all, and you will find that most Australian towns are near rivers. Where there are no rivers, you will see great stretches of land with no names of towns marked on them.

4. In England there are many rivers, as well as streams not big enough to be called rivers. So no part of the country is without water, and there are no great tracts of land without towns or villages.

5. But the people in towns do not go down to the rivers and draw water for themselves. That would be impossible. Fancy what a sight it would be if all the millions of people in London had to rush off to the Thames with buckets and jugs every time they wanted water for washing or drinking!

6. As we all know, the water is brought to the houses through pipes. All we have to do is to turn on a tap, and out flows the water. You have no trouble except when the water freezes in the pipes and splits them. Then when it thaws you get more water than you want.

7. London gets most of its water from the Thames. At Sunbury and Kingston there are great water-works. Millions of gallons are taken every day from the river, and filtered so as to remove all the dirt from the water. Then the water passes through pipes to all parts of the city.

AN EGYPTIAN WATER SELLER

8. Besides supplying water for houses, rivers are useful to farmers. They drain the land, that is, they carry off the water that would turn it into a marsh and hinder the crops from growing. Fields that lie near rivers have generally rich grass on which cattle feed and grow fat.

9. In our country, we, as a rule, have quite enough rain to water our crops; but in some hot countries, where rain falls only rarely, the people have to get water from the river to water the fields.

10. In some parts of Egypt the people carry

water from the Nile for their fields. Sometimes the Egyptians use water-wheels turned by oxen, to spread water from the Nile over the land, when the river is low.

11. You may have heard how the floods of the river Nile help the farmers of Egypt. Well, people now help these floods to do their work by storing up water in reservoirs. Then they send it out in narrow channels over the fields when it is wanted, instead of letting the water all run off at once.

12. So in India, the water of the Ganges and of other rivers is stored in reservoirs in the rainy season for use during the dry season. In China, too, the water of the great river Yang-tse-kiang is made use of in the same way. This method of watering land from rivers goes by the name of irrigation.

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23. Some Famous Rivers

1. The Amazon, in South America, is the largest though not the longest river in the world. Its course is over 3000 miles. Think what a length that is compared with our tiny Thames, just over 200 miles long! Most of its tributaries are many times larger and wider than the Thames.

2. Rising in the lofty Andes, the river flows

mainly through level country. This is covered with water for miles and miles at certain times of the year, when the river overflows its banks.

3. The banks of the Amazon are lined with dense forests, so dense in many parts that there is no passage through them. Few people live there, and those are mostly Indians. They can manage to find their way in the forests, where a white man would lose himself, and die in despair.

4. Some of the trees are very valuable. The best india-rubber comes from Para, at the mouth of the Amazon. India-rubber is a thick juice got from a tree. If a hole is made in the tree the juice flows out and hardens when exposed to the air.

5. The St. Lawrence, in Canada, is another of the world's great rivers. Its mouth or estuary is quite as wide as that of the Amazon. The biggest ships can sail up as far as Montreal, nearly 1000 miles from the sea.

6. The waters of the St. Lawrence are bright and clear. The reason for this is that it does not rise in lofty mountains, that the rocks in its basin are mostly very hard, and that it passes through some very big lakes.

7. The Ganges has already been mentioned for its great delta. It is famous for other reasons. For one thing, it is the biggest river in India,

and there are more towns, perhaps, in its basin than in the basin of any other river.

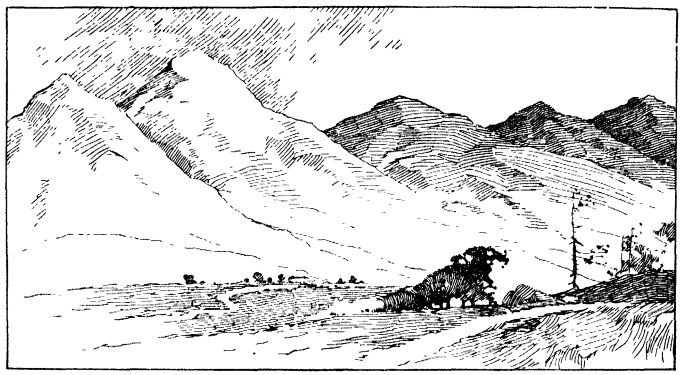
8. By the Hindoos it is regarded as a god. They pray to it, and come from long distances to bathe in its waters. They believe that in doing this they are cleansing themselves from their sins. Those who cannot travel to the river often buy bottles of Ganges water from the priests.

9. In Africa there are several gigantic rivers. The Nile has already been named; in the south there are the Congo and the Zambesi. They are not so well known as the Nile, for it is not many years since they were first explored.

10. The famous missionary, Dr. Livingstone, travelled a great deal in the basin of the Zambesi and of the upper Congo. Once he stayed so long without sending news home to England that people began to fear he was dead.

11. Then another African explorer was sent out to find him. This was Mr. (now Sir Henry) Stanley, who in later years explored the basin of the Congo, and who, next to Livingstone himself, is deservedly the most famous of African explorers.

12. The Volga is the longest river in Europe. It is a slow-moving river, and in winter is frozen over. People in that part of Russia through which the Volga flows then use it as a road, and travel on it in sledges.



Part of a Mountain Chain or Range

24. Mountains and Hills

1. There are hills in many parts of England, but mountains are only to be met with in the north and west. If you have seen a hill, you can form some idea of what a mountain is like, but after all, it is likely to be only a poor idea.

2. A mountain is often said to be a high hill. That is true in one respect. Both mountains and hills are high land, and mountains are higher than hills. Yet there are great differences between them.

3. A hill usually slopes gently from the bottom to the top; or, to speak more correctly, we should say from its *base* or foot to its summit. The whole of it is covered with grass, and trees may be found growing on its summit.

4. The slope of a mountain is usually steeper;

if not all the way up, still it is so for the greater part. In its sides there are often precipices, that is, places where the mountain-side drops down straight like a wall.

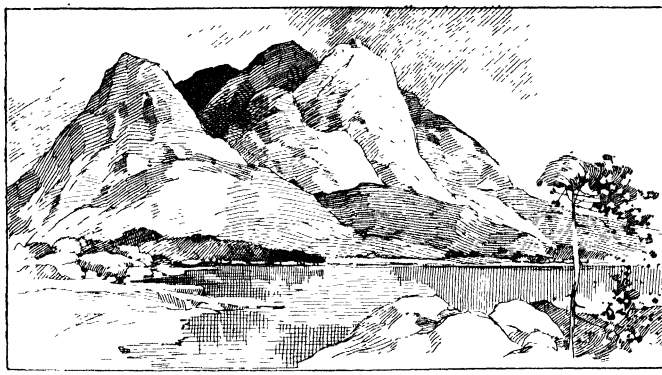
5. Grass may grow on the lower slopes of a high mountain, but not on the summit. There the ground is bare or covered with great stones. These are buried under snow for most of the year, and sometimes even in summer.

6. To climb a hill is not a difficult task. Generally you may start at any point at its foot, and go up the side without turning to right or left. But a mountain cannot be climbed in this way.

7. The paths are few; they turn and twist to pass round great rocks or to avoid precipices. Guides are often necessary to point out the way, and mountain climbers find sticks provided with iron spikes useful. These keep them from slipping, and also support them as they climb.

8. These differences between mountains and hills can be seen even in the mountains of England and Scotland; and the height of these is nothing when compared with the Alps in Switzerland or the Rocky Mountains in America.

9. It is true that there are some hills which resemble mountains in being steep and rugged. The Malvern Hills in the West of England are hills of this kind, although they are not much more than 1000 feet high.



A Mountain Group

10. Mountains and hills are seldom found singly. They either form a long line, called a *chain* or *range*, or they are dotted about without any order and form a group.

11. The Pennine Chain, which stretches from the North of England to the centre, is a good example of a chain or range. Its neighbour, the Cumbrian Group, consists of mountains which cover a great part of the counties of Cumberland and Westmoreland.

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25. Some Mountains in Great Britain

1. The highest mountain in England is Scafell-Pike, in the Cumbrian Group. It is only a little more than 3000 feet high. Snowdon, in Wales,

is 500 feet higher. Ben Nevis, in Scotland, reaches a height of 4406 feet.

2. Ben Nevis is therefore more than three-quarters of a mile high; but you would have to walk a distance of six or seven miles to get from its base to the summit.

3. That would be a couple of hours' walk on an easy road, but you would do very well if you got up Ben Nevis in three hours. And if you met with a fog on the way or a snow-storm—as you easily might even in June—it would possibly take you twice or three times as long.

4. The last part of the climb is over rough stones, and the path over these is sometimes made worse by a covering of snow. At the summit you may look down a precipice which is more than 1000 feet deep.

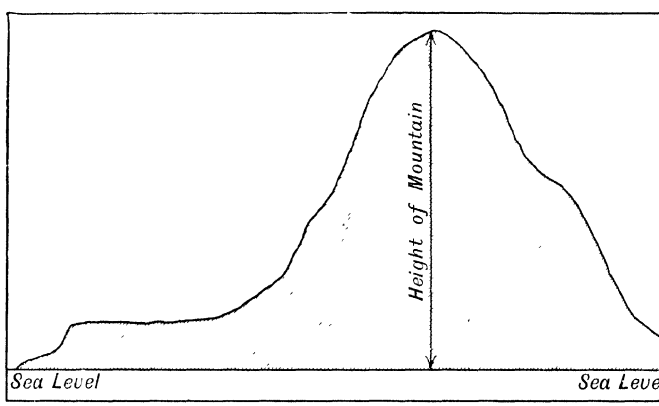
5. Perhaps you wonder how it is that the path up Ben Nevis is so long when the mountain is not a mile high. You must remember that the sides of mountains seldom rise straight up. If they are mountains men can climb they must slope, and that not too steeply.

6. When we say that Ben Nevis is less than a mile high, we mean in vertical height or height above sea-level. So that, though Ben Nevis is less than a mile high, even if the path went straight up the slope, instead of winding about, it would be much more than a mile long.

7. You can get an idea of what is meant if

you can imagine Ben Nevis floating on the top of the sea. Then fancy a long stick thrust through the middle of the mountain from the summit down to the surface of the sea. That stick would measure the height of Ben Nevis, and would be 4406 feet long.

8. As a rule, each mountain or hill has a name of its own. Many of the names of the Scottish



How the height of a Mountain is measured

mountains begin with "Ben", which means mountain. The word "Fell", used in the names of some mountains in the Cumbrian Group and Pennine Chain, has the same meaning.

9. The name "Peak" is often used to describe a mountain that stands apart from others. There is a mountain at the south end of the Pennine Chain which bears this name only, and is called "The Peak".

10. Sometimes you can learn a fact about a hill from its name. The Hog's Back in the North Downs is in shape something like the back of a pig. Churchdown in the Cotswold Hills has a church on the top.

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26. Great Mountains

1. Lofty as some of the mountains of our country appear to us, they are in reality quite low when we compare them with the loftiest mountains in the world.

The highest mountain on earth is Mount Everest, to the north of India.

2. Since India belongs to us, we may say that the highest mountain in the world belongs to us too. Mount Everest is 29,000 feet high; that is, about five and a half miles.

3. Compare the height of Ben Nevis with this, and what do we find? That if seven of the highest mountains in the British Isles were piled on top of one another they would only reach to the top of Mount Everest.

4. What a huge mountain it must be! It is one of the peaks of a very lofty range of mountains, the Himalayas, which stretches along the north of India for fifteen hundred miles.

5. The tops of these mountains are always

covered with snow. This is not because the Himalayas are in a cold part of the earth, for India is very hot. It is because the higher we ascend, the colder the air becomes.

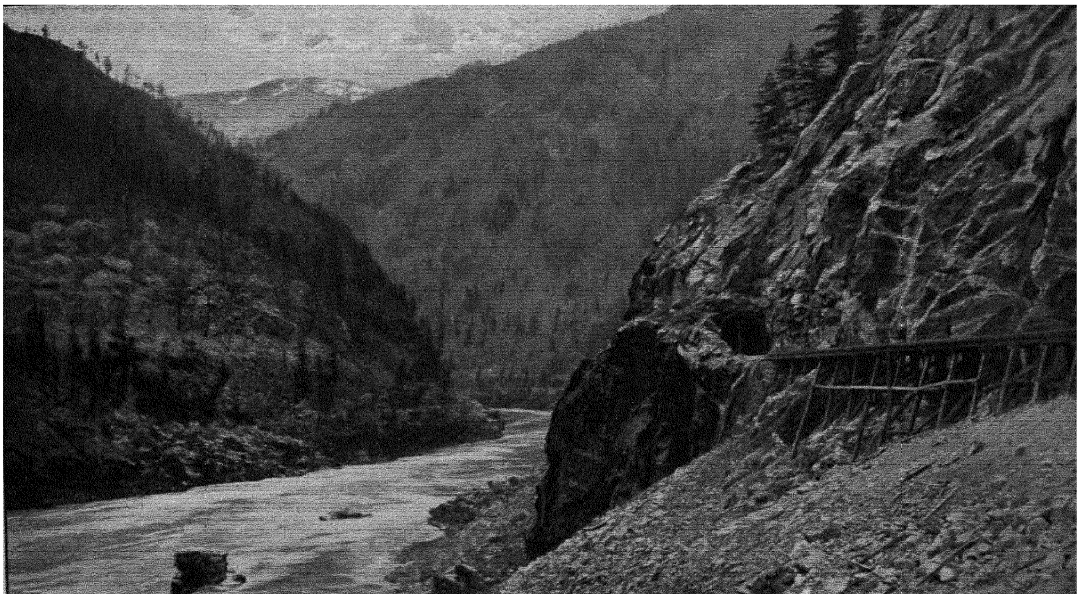
6. In climbing the Himalayas, we should find that we gradually passed from burning heat at the base of the range to cool air and bleak winds above; and long before we reached the top, we should come to a height above which the snow never melts.

7. The height above which the snow never melts on mountains is called the Snow-line. It is not the same all over the world. In hot countries it is very high, in colder countries it is lower. There is no mountain in our country which quite reaches the snow-line; but Ben Nevis is only a little short of it.

8. Another lofty mountain range is the one which runs for several thousand miles along the west coast of America. It receives different names in different parts. For instance, in North America it is called the Rocky Mountains, while in South America the range is known as the Andes.

9. It is the longest mountain range in the whole world; and the Amazon, as well as other long rivers, have their sources in it.

10. Here are some strange facts about a high mountain peak in the centre of Africa, Kilimanjaro. Its summit is nearly 20,000 feet above the



From a photograph by 'Notmann & Son, Montreal

A CAÑON ON THE FRASER RIVER. At the side is seen the Canadian Pacific Railway Track

ALETSCH GLACIER, SWITZERLAND

sea-level, and is always covered with pure white snow. But at the foot of the mountain there are splendid groves of palms and bananas, acacias, cocoa-nut, and mango trees — plants which grow only in the hottest countries.

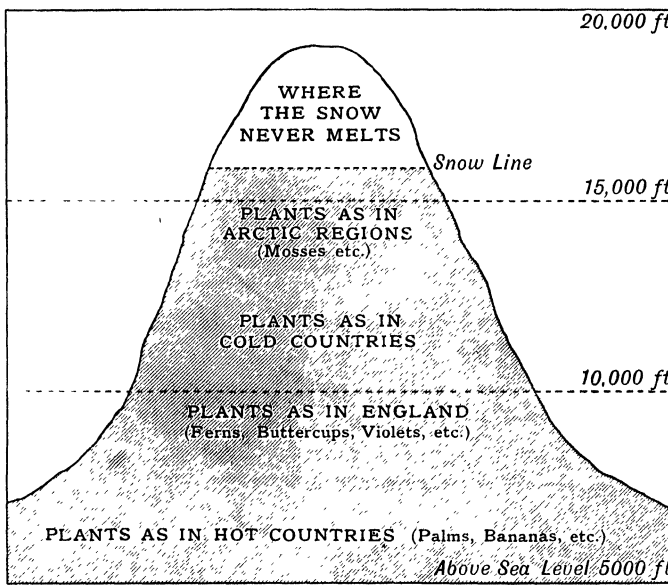


Diagram of Kilimanjaro

11. Going some distance up the mountain, you would meet ferns and buttercups, violets and other plants, like those which grow in our own country. Going up still farther, you would notice that the trees were getting thinner,

though the grass would still be green and the flowers numerous.

12. At a height of 13,000 feet, you would find no flowers; the grass would be thinner and duller in colour, the trees stunted, and the streams on the mountain-side would often be frozen over.

13. At the height of 15,000 feet very few plants would be found, but you might see rocks covered with green and red mosses. Then at length you would reach a region of everlasting snow and ice.

14. The highest mountain in Europe is Mont Blanc, the "White Mountain". It is so called because its summit is covered with perpetual snow.

15. This mountain is 15,775 feet high, and is one of the peaks of a lofty range called the Alps. Thousands of people go every year to spend their holidays amongst the high lands and valleys of the Alps, because the scenery there is so very beautiful.

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27. Valleys

1. Every boy who has been for a long walk in the country, or has made a journey by train, must have noticed that the surface of the land is very uneven. Some parts are much higher than others. These are the hills, or mountains.

The hollows, or low parts, between them are valleys.

2. No two valleys are quite alike. Some are so small that they could be crossed in a few strides, while others are miles in width. Some have steep sides, but the sides of others slope so gently that we hardly notice the incline.

3. There are valleys we love for their beauty, because they are covered with grass and dotted with trees and flowers; and there are valleys we dislike, for they are bare, rocky, and cold.

4. Various names are given to valleys. Sometimes they are called Dales, sometimes Vales, sometimes Straths, or Glens. As a rule, a dale takes its name from a river flowing through it. Thus, Wharfedale and Airedale in Yorkshire are valleys that take their names from the rivers Wharfe and Aire, tributaries of the Ouse.

5. A vale is generally broader and flatter than a dale, and takes its name from some important town that is situated in it. So we find such vales as the Vale of York in Yorkshire, and the Vale of Aylesbury in Buckinghamshire.

6. Yet, in spite of their differences in size and appearance, most valleys have one point of likeness. At the bottom of the valley there is generally to be found a stream of running water, either brook, rivulet, or river.

7. It is by the action of this running water, that the valleys are gradually made deeper and

wider, for whenever there is a shower of rain, some of the soil along the sides of the valley is washed into the stream, and carried away by it.

8. It seems hard to believe, at first, that water should so scoop out great valleys in the earth's surface. But remember that the work has been going on for ages. Day and night, month after month, year after year, during the rain, hail, and frost of winter, and the heat of summer, the stream has been gradually cutting a deeper groove or bed for itself in the land, and carrying away the soil washed into it.

9. The valley that the Thames has made for itself stretches for some distance on each side of the banks. It is rather flat but well-wooded and fertile, and presents, on the whole, a scene of peaceful loveliness not easily matched.

10. One of the strangest valleys in the world is the Yosemite Valley in California. It is about ten miles long, and a mile wide. Steep rocks of about 3000 feet high shut it in on both sides.

11. Yet, deep as this valley is, it has been formed by a river. There are many of these narrow deep valleys in America, and they are called Cañons. The river Fraser in British Columbia flows through some at one part of its course. By the side of the river there is a railway line laid on ledges carved in the rocky walls of the cañons.

28. Glaciers

1. The tops of very high mountains, as we have said, are covered with snow. What becomes of all the immense heaps that fall year by year on the mountains? The snow cannot melt because of the cold.

2. A great deal of it falls down the mountain-sides in huge masses called Avalanches. An avalanche contains tons and tons of snow, and sweeps everything before it on its way down to the valleys. Houses and trees fall before it as if they were grass.

3. But most of the snow does not fall in avalanches. It crawls downhill. To understand this, we must remember that though snow is soft, yet when it is squeezed it becomes as hard as ice.

4. A snowflake consists of tiny pieces of ice, with little spaces between them filled with air. Squeeze a handful of snow, and you press out the air, leaving the ice only.

5. Well, the snow on the mountain is pressed together by its own weight. The pressure is enormous. In course of time the air between the bits of ice is driven out, and the snow becomes pure ice.

6. Meanwhile more snow has fallen above. The weight increases, and the ice is forced to

crawl down the sloping side of the mountain. Then it is a river of ice, or a *Glacier*.

7. This, too, works like a river. As a river hollows out its bed through the valley, so the glacier carves a bed for itself down the mountain. As a river carries mud and rolls stones along

Ice Cave, forming lower end of Zermatt Glacier

with it, so the glacier carries stones and rocks and mud along with it.

8. Some of these stones are on its surface, which is not smooth like a skating-pond. Some are right underneath it. How do they get there? As the ice cannot turn easily like water, when the glacier creeps round corners, great cracks called *crevasses* are formed, and stones roll into the holes right to the bottom.

9. These stones and rocks act like carving-knives on the sides and bottom of the valley. They scratch and scrape all the way, thus making

a fine mud. When the glacier gets below the snow-line the ice melts and forms a stream. This carries the mud along to the plains, where it is deposited and forms the rich soil from which the farmer raises his crops.

10. At the lower end of a glacier there is a cave. Along the floor of it there flows the stream formed by the melted ice, but the walls and roof of the cave are ice. What a change it must be to pass suddenly from summer heat to the chill air of an ice cave!

11. The beginning of the river Rhone is nothing but a melted glacier, which has been wearing away the Alps for ages to make the fruitful fields of Southern France. The beautiful Rhine, which is mainly a German river, also starts in a glacier.

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29. Caves

1. Near the village of Castleton, in Derbyshire, there are some very famous caves. Caves are hollows or openings in the earth, and are often found in the sides of hills and mountains.

2. The largest of the caves in Derbyshire is the Peak Cavern. The entrance to it is about 40 feet high and more than 100 feet wide. If you pass through this opening, you find yourself in a great chamber, which extends into the earth for about 100 yards.

3. Then it becomes narrower, but farther on widens out into a second great and dark chamber, where a guide is waiting to conduct visitors through the cavern. Following him, you are led onwards through dark passages, lighted only by the guide's torch, until the sound of falling waters strikes your ear.

4. For there, far underground, a stream flows along in the darkness, tumbling over rocks, and splashing in waterfalls. Then it disappears altogether in the earth, and only reappears, at the surface of the ground, some miles away.

5. There are other important caves in England. One is at Kirkdale in Yorkshire. Another is Kent's Hole in Devonshire. In this there are often found the remains of the work of men who lived long, long ago, and who sought shelter in this great hole in the earth.

6. And now there are occasionally dug up from the bottom of the cave the sharp flints they used as knives and axes, and the smaller flint flakes they used for the tips of their arrows when hunting.

7. In the famous Cheddar caves in Somersetshire the rocks have taken strange shapes. In one part there is a curtain of stone, looking exactly like a window-curtain. Sharp points of rock hang like icicles from the roof, or stand up from the floor like spikes.

8. There is also a large basin or bowl, shaped

as perfectly as any potter could make it. All these have been formed naturally from the lime contained in the water that drips continually from the roof and sides of the cave.

9. One of the largest caves in the world is the Mammoth Cave of Kentucky, in the United States. This wonderful cave is so vast that it stretches for miles into the earth. It is possible to walk through its lofty chambers and winding passages for at least thirty miles.

10. It would be difficult to avoid getting lost in the darkness of this huge cavern, if it were not for the guides, who are at hand with flaming torches to conduct visitors round.

11. Pillars of brilliantly-coloured rock, twisted into a thousand shapes, glitter as the light from the torch flashes on them. In one part you enter a rocky chamber, so lofty, and so dark that not even the great fires, which are lighted in it by the guides, can show the roof.

12. In another part you come to the edge of a chasm so deep, that you cannot help shuddering as you watch a lighted torch, thrown into it, sinking deeper and deeper into the abyss below.

13. In many of these underground passages there are streams or pools in which fish are found. These have never seen the light of day; and, indeed, they never could see it, for they are without eyes.

30. Climbing the Alps

1. Thousands of people visit Switzerland in the summer-time to enjoy its beautiful scenery. Many go also to climb its lofty mountains.

2. Some of the lower mountains may be ascended without any great difficulty; but the greater heights, like Mont Blanc and the Matterhorn, can only be climbed with hard toil and at great risk. Yet there are many who count it the greatest pleasure in life to face both the toil and danger of Alpine climbing.

3. Those who make these ascents need be strong, active, and healthy. They must wear thick, strong clothing and heavy, nailed boots. They need these, for the rocks are sharp and often slippery, while the cold they have to endure is bitterer than that of winter.

4. In their hands they carry a long, stout stick. This has a pick at one end to make holes in ice, or it may be in the rocks, to help them in climbing. At the other end there is a sharp spike, which serves to keep them from slipping.

5. Often they have to carry food with them, for the climb is sure to take many hours, and it may last for a day or two. In some cases, huts have been made as shelters, high up on the mountain-sides.

6. The mountaineers may climb as far as one

of these shelters in a day, and rest there for the night. Then, the next day, they go on to the summit, and return to spend a second night in

Mountain Climbers

the shelter. The third day sees them return to the foot.

7. They seldom climb without guides, and indeed it is not wise to do so. The guides are men who have lived all their lives among the Alps, and do nothing else but climb for a living.

8. Strong ropes have to be carried with each

party. Some parts are so steep, and so close to precipices, that a slip would hurl one down for thousands of feet. To prevent this the climbers are roped together.

9. A guide leads the way, with the rope tied round his waist. The rope is then fastened round the other climbers, a guide between each pair. If one slips the others stand firm and support his weight, till he regains his footing.

10. Often, in crossing crevasses in glaciers, the rope is needed. These gaps are sometimes bridged over, and hidden by snow. This may be firm enough to allow one or two to pass over in safety. The next, perhaps, slips through. The others, then, dig their picks in the ice to hold themselves firm. For a time the unlucky climber dangles over a crevasse, perhaps hundreds of feet deep, until his companions drag him out.

11. Hands, as well as feet, are used in climbing. At times a long ridge has to be passed over, like the ridge on a house roof, but with an edge almost as sharp as a knife. The climbers sit astride this, and work their way slowly for perhaps a couple of hundred yards. This will explain to you why they need strong clothes.

12. When they near the summit, not only is it bitterly cold, but they find a difficulty in breathing. The air is so thin that the climbers have to breathe very quickly to get enough of it.

Many people, too, find themselves sick and dizzy at the top of great heights.

13. One of the greatest pleasures of mountain climbers is a slide. Fancy a slide hundreds of yards long, not over ice, but on snow. This is a luxury that mountaineers may get, as they are coming down.

14. They fix their spiked sticks in the snow to steady themselves, they lean back and away they go. Of course they take good care to see beforehand that their slide does not end at a precipice, else their sliding days would soon be ended.

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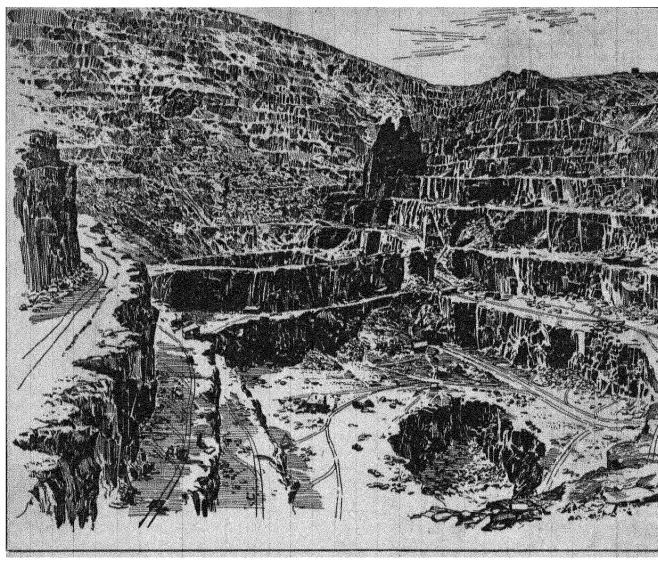
31. Uses of Mountains

1. It may not be pleasant to live always near great mountains, yet mountains are exceedingly useful to us. We cut great quarries in their sides, and use the stones got from them for many purposes. Many of our houses, schools, and great buildings are built with the stone obtained from the mountains of Cumberland and Scotland.

2. We roof our houses with the slate dug from the hills in North Wales, and use smoother forms of it for writing on in school. With granite and marble we ornament our public buildings, and raise statues to our famous men.



Penrhyn Slate Quarry, Snowdon

3. We make our roads, and pave our streets, with stones obtained from the sides of the mountains. The woodman sharpens his axe, and the grinder his knives, on grindstones cut from the lower slopes of the Pennine Chain; while the hills of Derbyshire and Yorkshire supply us with door-steps and hearth-stones.

4. But stone for our buildings is not the only useful kind of rock we get from the hills. Along the slopes of the Pennine Chain, and in South Wales, a more useful rock, coal, comes very near to the surface. So coal-pits have been sunk, and from them we obtain coal to warm

our houses, cook our food, and make gas for lighting our homes and streets.

5. Then in many places iron-ore is found amongst the hills; and coal and iron, as we know, are the two most useful minerals.

6. But mountains are useful to us in another way. Sometimes they shut off cold winds, and so protect the farmer's crops.

7. Mountains are noted as rain-makers. Of this the Pennine Chain is a good example. The warm west winds, that blow from the Atlantic, bring with them some of the vapour that is constantly rising from the surface of the sea. This vapour is not visible till it is cooled, and then it appears as mist and clouds, which fall in rain.

8. The Pennine Mountains and the Cumbrian Group chill the vapour brought by the west winds blowing over the sea, and turn it into rain. This falls on the western slopes of the mountains, which as a result have more rain than the east side. The wettest part of England lies in the Cumbrian Group.

9. Mountain air is clearer, purer, and more bracing than the air of valleys. In India, white men regularly spend their summers in the hills, because the intense heat of the lower ground is unhealthy. Many English people visit the mountains of Scotland or Wales to regain the health they have lost in the close air of towns.

10. At one time, when there were no railways and telegraphs in England, mountains and hills were used to signal news of danger to the country. Great fires were built on them, ready to be lighted as a warning.

11. These fires were called Beacons, and we find that there are many hills which have taken their names from the use that was thus made of them.

32. Volcanoes—I

1. Men, who go down into deep mines, tell us that the deeper they go, the hotter it becomes. Sometimes, too, when very deep holes have been bored in the ground, the water which has risen to the surface has been quite warm. Indeed, in New Zealand and other countries the water, which bubbles up from deep springs, is hot enough to cook with.

2. All this seems to show us that the interior of the earth, far beneath our feet, is very hot. But what we learn about it from mines and wells is, after all, only little, because even the deepest of them goes but a short way down into the earth.

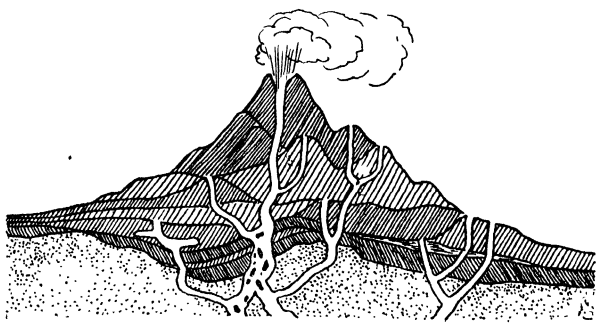
3. We learn more about this heat from Volcanoes. These are openings in the earth, through which steam, gas "dust", or lava is sometimes forced from below.

VOLCANO (VESUVIUS) IN ERUPTION

From a photograph by Valentine & Sons, Ltd.

HOT SPRINGS, NEW ZEALAND

4. Usually the opening forms the centre of a mountain or hill, shaped like a cone. At the top of this there is a big hollow, like the inside of a cup or bowl. This is called the Crater. At the bottom of the crater is the pipe or vent which runs down into the interior of the earth.



Section of an Active Volcano showing several pipes or vents, and also the beds of lava and ashes which have issued from these pipes

5. There are long periods during which a volcano is quiet. It is then said to be dormant, a word which means sleeping. Then without much warning large quantities of ashes or lava are forced out of the opening at the bottom of the crater, and the volcano is said to be in a state of eruption.

6. If the outbreak is very violent the top of the volcano may even be blown off, and fragments of rock shot high into the air.

7. The melted rock, or lava, which pours forth

does not flow quickly, as water does. It creeps along, as treacle would do if poured down a gentle slope. Some volcanoes in New Zealand pour out streams of hot mud.

8. The outside of the lava stream cools quickly and becomes hard, but the inside remains hot for a long time. It is thus possible to walk on lava that is fiery hot a few inches below the feet.

9. Volcanoes are seldom found far from the sea. It is true that extinct volcanoes are sometimes found far inland. But there is good reason to believe that, long ago, the sea was near these too.

10. The nearness of volcanoes to the sea seems to show that water has something to do with the outbursts that occur. We are told by men who have studied the subject, that long, long ago the whole of the earth was very hot, and that it has been cooling ever since.

11. The outside cooled first, and is the part on which we live. Far down in the interior it is still very hot. When water sinks into the earth to this hot part it is changed to steam.

12. As steam takes up much more space than the water it is made from, it finds itself cramped for room. So the steam tries to escape, just as steam in a boiling kettle tries to escape by the lid as well as from the spout.

13. The earth's steam does make its way at last through the opening in the crater of the volcano.

It bursts through with such force, that it throws up various substances and strews them over miles of the country round.

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33. Volcanoes—II

1. Rather more than eighteen hundred years ago, the district that lies about Mount Vesuvius was one of the most beautiful and fertile parts of Italy. Large and wealthy cities had been built near the mountain; vineyards were cultivated on its slopes, and the people had no reason to think they were living in danger.

2. But in the year 79 A.D. they had cause for uneasiness. Low rumblings had been heard in the earth, which they could not account for; and at times even the ground beneath their feet had been severely shaken. A few years earlier, too, a small earthquake had occurred, which partly destroyed one of the cities.

3. Still, it did not occur to the people even then to think that Mount Vesuvius was a volcano. They had lived near it all their lives, and no harm had come to them; their fathers had always lived near it, too, in safety. What could there be about the mountain to make them afraid?

4. But one day a change came, and the

mountain lost its usual quiet appearance. Immense clouds of smoke and steam rose into the air from its summit. While the people stood gazing in astonishment at the unusual sight, the top of the mountain itself was blown off with tremendous force.

5. The air was filled with dense clouds of fine ashes, that spread over the sky and hid the sun, so that thick darkness spread over all.

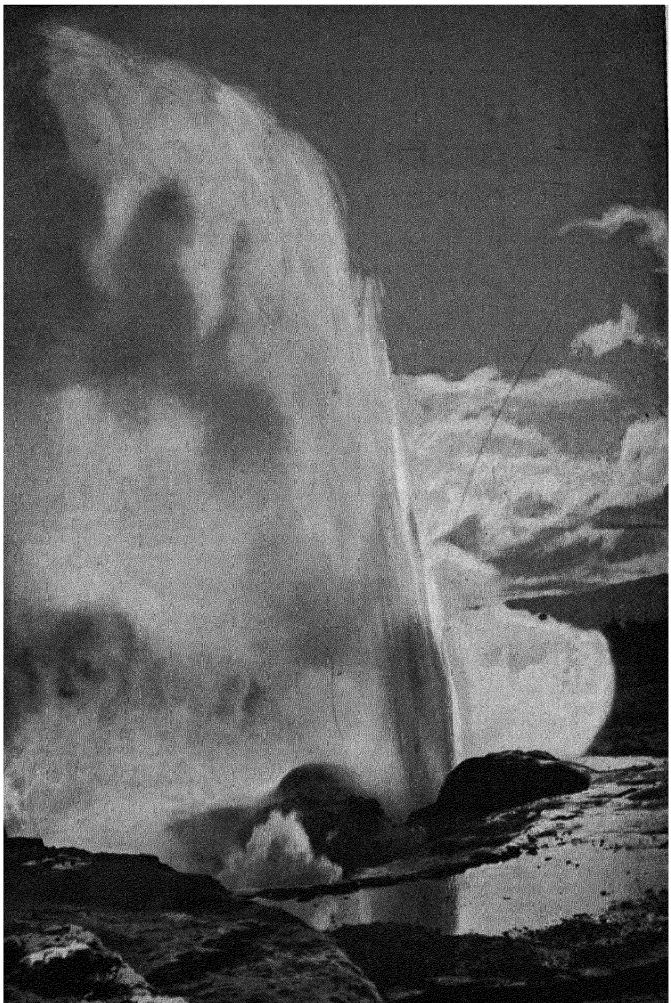
Not far away was the sea, where ships had been lying quietly at anchor. But the waters of the sea rose in great waves, and tossed the ships about as if they were in a storm.

6. Then horror seized the unhappy people, who ran from the towns in every direction to save their lives.

After some days, when the shower of ashes had ceased, one of the cities was found to be covered with them to the depth of three feet. Many of the people then returned to their homes, thinking all danger was past.

7. But a second outburst took place, and escape for many of the people became impossible. Showers of hot ashes and pieces of rock rained down, and struck them to the ground; or dense, foul gases choked them, and they fell, to perish by hundreds. Even a dozen miles away from the mountain, people were killed by the poisonous gases.

8. Two whole cities that we know of, Pompeii



From a photograph by Valentine & Sons, Ltd.

HOT-WATER GEYSER, NEW ZEALAND

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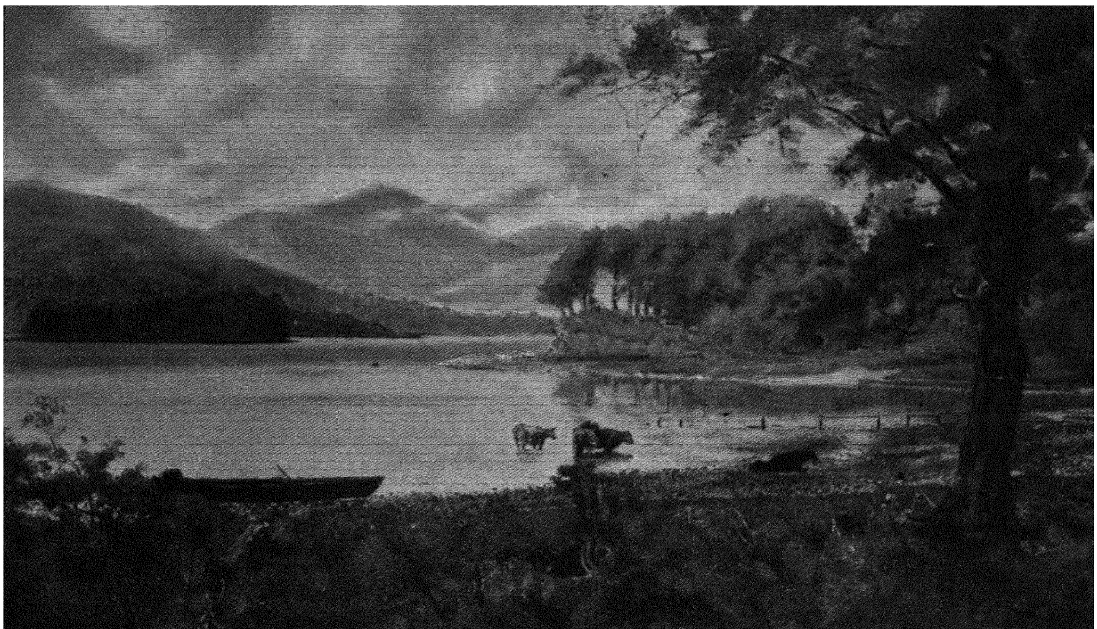

SCENE ON DERWENTWATER, NEAR KESWICK

Photo. Valentine

and Herculaneum, were buried by the fallin ashes, or covered with the mud that came wit the following rain; and it is probable tha several villages, too, the very names of which w do not know, were destroyed at the same time.

9. What had been a beautiful district becam a ruin. People avoided it as they would disease. The very site of the cities was for gotten; and it was not until seventeen hundre years later that the cities were found by acciden during the sinking of a well.

10. Since then they have been opened out b digging; the houses have been uncovered, th roads laid bare; and it is now possible to wall in the very streets the Romans trod, and to visi the temples in which they worshipped nearl two thousand years ago.

11. Mount Etna, in Sicily, is another volcano It is more than 11,000 feet high. Its summit i covered with snow. Yet from this mountai streams of lava sometimes pour forth. Histor tells us that the town of Catania, at the foot o the mountain, has been partly destroyed twic by the lava which has flowed from the volcano.

34. Earthquakes

1. The surface of the earth on which we live seems, generally, quite firm and steady.

Yet at times it is roughly moved, and even broken open by those shocks and shakings which we call Earthquakes.

2. Fortunately for us, the earthquakes which occur in our country are slight, as well as rare, and are therefore hardly noticed. A quiver in the ground is felt, there is a rattling of the window-panes in the houses, or the cracking of a few walls, but generally that is all.

3. But in some parts of the world an earthquake is a terrible thing, for the ground is so shaken, that houses are destroyed, and many lives are lost.

4. One of the most dreadful earthquakes, that ever took place, was that which occurred at Lisbon in the year 1755 A.D. It was all over in a few minutes; and yet in those few minutes half the city was destroyed, and sixty thousand people perished.

5. First, there was a sound like thunder, yet it came, not from above, but from the ground beneath.

This rumbling noise increased to a loud roar, and the ground quivered, rose, fell, and then split open in a huge gap. Many people and

buildings were swallowed up instantly by the yawning gulf.

6. Thousands of people rushed down to the river-side, thinking that, there at least, far from falling buildings, they would be safe. They clustered, in fear, on the great landing-stage along the bank of the Tagus. But this suddenly gave way under the great weight upon it, and, sinking beneath the water, carried the people with it. All were drowned.

7. Then, as if to complete the earthquake's work of destruction, a huge wave, some 50 feet high, came up from the sea. It swept with a roar over everything that remained, dashing the ships in the harbour to pieces, and drowning many persons who had escaped from the previous dangers.

8. The shock of this earthquake was felt over the greater part of Europe. As far north as Scotland the ground shook, and the waters in the lakes tossed to and fro; while in Africa a whole town was destroyed, and some thousands of people lost their lives.

9. In some parts of South America, earthquakes are so common, that the people get quite used to them. This is shown by their curious habit of leaving open the doors of rooms, in which they happen to be. If the doors are shut when an earthquake occurs, they will most likely be jammed too tightly to be opened,

and so prevent people from escaping into the streets.

10. They build their towns in wide streets, with wooden houses only one story high. If these are thrown down, the damage and the danger will be less than if they were high, and built of stone.

11. The cause of earthquakes is not exactly known. Nor are they all alike in their movements. In some the ground rises and falls, in others it moves backwards and forwards.

12. Some earthquakes are soon over, but others last for a long time. But whatever form they take, they always give people a sickening sense of fear.

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35. Geysers

1. You have heard that heat exists at great depths in the earth beneath us, and that the water which issues from certain springs is quite hot. Even in our own country, there are hot springs at Bath, Buxton, and elsewhere.

2. But in some parts of the world, especially in volcanic districts, the water that comes from the springs is much hotter than this, and in some cases is even boiling. The best known of these hot springs are in Iceland. They are called Geysers, from an Icelandic word, *geysir*, which means gusher.

3. A geyser is really a great fountain of hot water, which is not poured forth continually, but from time to time. There are many geysers in Iceland. In the pools near some of them the natives cook their food; while, over some of the small ones, huts have been erected to serve as steam baths.

4. The most striking and important of them all is the Great Geyser. When seen at rest, this appears as a large pool of hot water, contained in a saucer-like basin, about 50 feet in diameter, and 4 feet deep. The inside of the basin is lined with a pure white hard substance like marble, which has been deposited from the boiling water.

5. In the centre of the basin there is an opening about ten feet across, which runs down into the earth, and which is also full of hot water.

6. Before the water is poured forth, low rumbling sounds are heard in the ground below the geysers. The ground round about is shaken, and then the hot water is suddenly hurled into the air to the height of nearly 100 feet.

7. After playing in the air for about five minutes the water sinks back into the basin with a great rush, and there is again a period of quiet.

8. But the geysers of Iceland are far surpassed in size and beauty by those in the Yellowstone district in the United States. In one part of this district—the Firehole Basin—there are not

less than fifteen hundred geysers and hot springs, all varying in size, form, and colour.

9. The largest of them is called the Great Geyser. When it begins to act, it first fills a large hollow or basin with boiling water, forming a deep well quite 20 feet across and 100 feet deep. Before the water shoots forth, clouds of steam rush up into the air to a height of nearly 500 feet.

10. Then the whole of the boiling water in the great well is shot up about 90 feet into the air. From the top of this great liquid column jets of water shoot still higher, until, it is said, they rise to a height of 250 feet from the ground.

11. Among other remarkable geysers in this district are the Giant, the Giantess, and Old Faithful. The latter is so called because water is shot up from it regularly, at intervals of about an hour. Some of these hot fountains can be made to play by flinging in a stone or a piece of turf.

12. New Zealand contains the largest number of these hot springs and pools. The ground round them is in many parts unsafe to walk on, as can be seen by the jets of steam that come from it. Invalids from all countries come to bathe in these waters, and many are cured.

36. Lakes—I

1. "Hurrah! What do you think, Madge?"

"Oh, I think a great many things, Harry."

"Well, we are to go to see lakes and rivers and everything for ourselves when we go away, and Dad says he thinks it will be next week."

"Oh, how lovely!" cried Madge.

2. "But it depends, Dad says, upon how I get on with this geography, and whether I really take an interest in it. When I told him that I was giving you lessons, he laughed. And then he said, 'Madge had better go too'."

3. "Hurrah, hurrah!" shouted Madge.

"Really, Madge," said Harry laughing, "you are not serious enough for a downright student. If I am to get you on, you certainly must be more—more—"

"'Sedate'. Dad says," added Madge.

4. "Yes, that is the word, Madge. Now, *are* you sedate?"

"Yes, Harry; but you are not teaching me anything."

"Come, then, what we did this morning was lakes."

"Oh, I know what a lake is," said Madge; "it is only a big pond."

5. "That is right to some extent, Madge, but would you call a lake as big as Ireland a pond?

I should not. There is a lake in Canada, for instance, which is called Lake Superior, and is as big as Ireland. Why, ships sail on it, Madge; and there are storms on it, just as if it were a sea.

6. "Now then, Madge, what is a lake?"

"A piece of water entirely surrounded by land. Isn't that a good answer, Harry?"

"Yes, that will do very well, Madge. Well, Dad told me a great deal about lakes, but he said he was afraid I should not remember half of it. So I am going to write it all down to show him."

7. "Do you think you can do that, Harry?"

"Of course I can, Madge. Jim Brown wrote a long tale, that he made himself, all about pirates and robbers; and he is no older than I am."

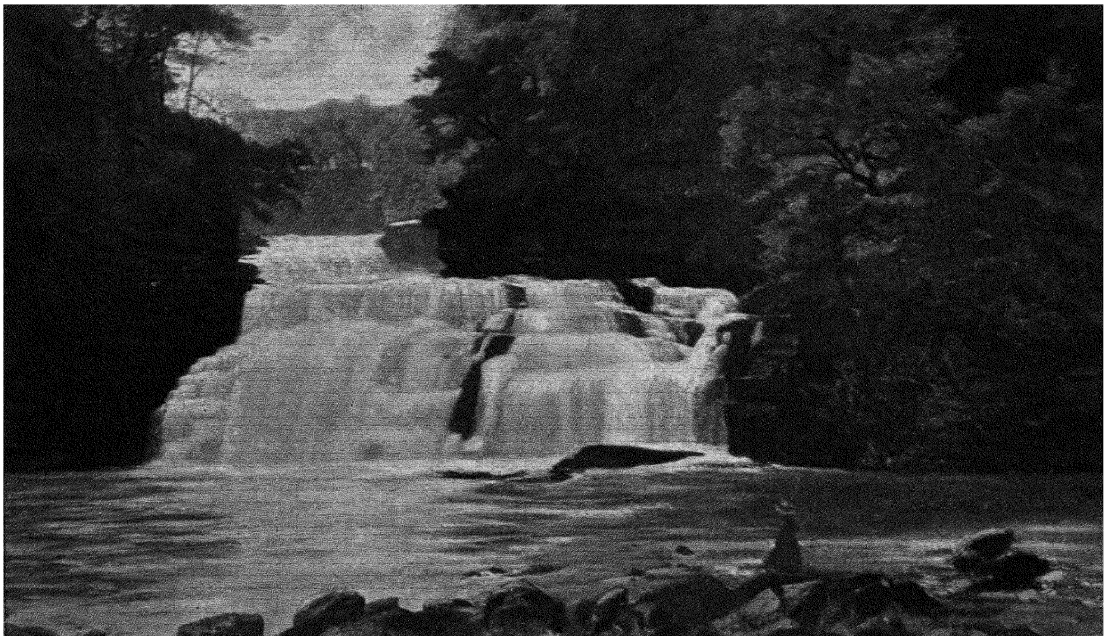


Photo. Reid

CORA LINN, ON THE CLYDE

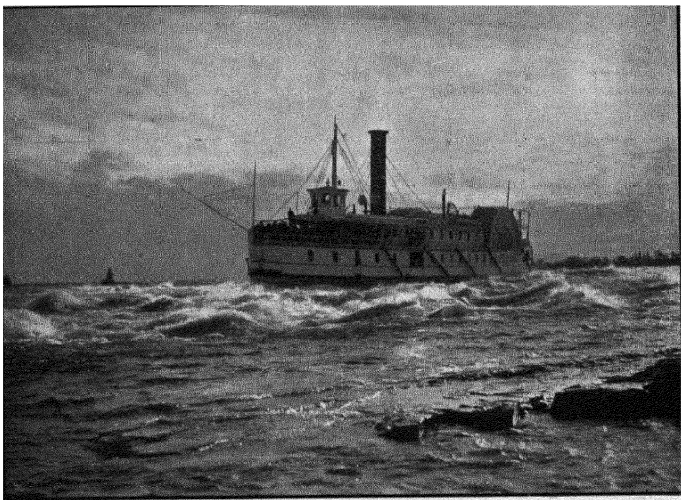
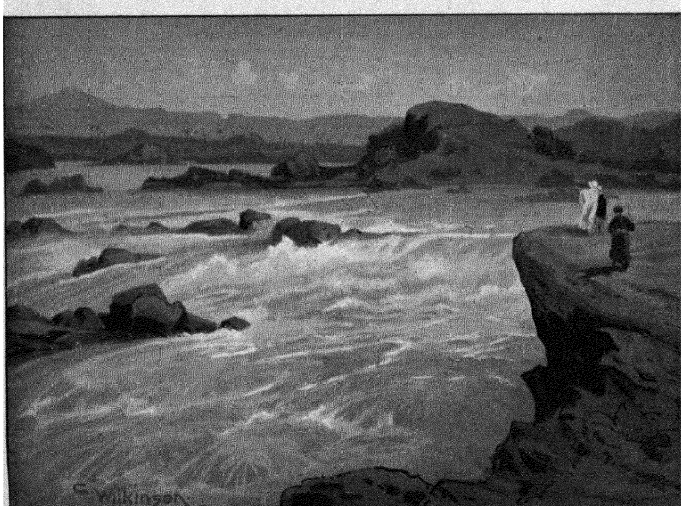


Photo. Notmann

The Rapids of the St. Lawrence



A Cataract on the Nile

8. "I am sure you can then, Harry. But do tell me something of what Dad told you."

"Very well, Madge. You sit still and listen, and I will.

9. "Dad said that lakes are often made by rivers. Perhaps a river comes to a big hollow in the ground, and instead of going straight on about its business it fills up this hollow first, and then goes out on the other side."

10. "And are big lakes made like that, Harry?"

"Yes; that Lake Superior I told you about, and four other lakes nearly as big, are all made by the great river St. Lawrence. Dad says those lakes are one of the wonders of the world."

11. "What does that mean, Harry?"

"I think it means that folks wonder at them because they have never seen anything like them. But let me get on, Madge, or I shall forget the best bits."

12. "Do go on, Harry! I will not stop you again."

"Well, Dad said that some lakes were made— Oh, I am so sorry, Madge, there is Jim Brown with his big kite, and I promised to help him to fly it. But I will tell you the rest this afternoon."

37. Lakes—II

1. The afternoon was fine and warm, so Harry and Madge went and sat down under the old poplar-tree. Then Harry continued his lesson on lakes.

"Madge, where did I leave off this morning?"

2. "You were telling me how rivers made lakes, like those big ones in Canada, Harry."

"Madge, what a memory you have! I could not do better than that myself.

3. "Well, Dad told me of another way besides that. He says the hollows or valleys among the mountains are sometimes quite shut in. They are like big basins, and the mountain streams fill them with water, and as there is no opening for the water to run away, you see it must make a lake.

4. "The lakes are like that where we are going next week. It is called the Lake District. See, here it is among the mountains of the Cumbrian Group. We are going first to see Windermere, the biggest lake in England.

5. "Then Dad will take us to Ulleswater and Derwentwater. We shall see Thirlmere, too, the lake from which the people of Manchester get their water. Dad says they are all beautiful lakes."

6. "I shall like that, Harry."

"So shall I, Madge; but I shall like it better if I can go rowing and fishing on them."

"I don't care for fishing, Harry. I shouldn't mind it if you hadn't to put those nasty little worms on the hooks. Couldn't you do without them?"

7. "The fish wouldn't like it then, Madge. They are fond of worms, but they wouldn't eat hooks."

Madge laughed at that, and said, "Well, go on, please, Harry."

So Harry started off again.

8. "There are a great many lakes in Scotland, and fine ones too. Loch Katrine is one of the prettiest; and it is useful too, for it supplies nice fresh water to the big city of Glasgow."

"What does loch mean, Harry?"

"Oh, *loch* is the Scotch word for lake; in Ireland they spell it *lough*.

9. "Then some lakes have salt water instead of fresh. The streams that form the lakes get the salt out of the ground they run through. There is the Dead Sea in Palestine. That is very salt. Dad says you can float in salt water easier than in fresh, and that the Dead Sea is so salt that you could not sink to the bottom even if you tried."

10. "That is funny, Harry."

"There are funnier lakes than that, Madge. There is one in Trinidad, in South America, that

is full of pitch instead of water. It is pitch not unlike what the gardener put on the new palings yesterday."

11. "How nasty, Harry! I should not care to bathe in that."

"No, you would look funny if you did, Madge; you would have to wear a board afterwards with 'Mind the Paint' on it, for fear people would rub against you and spoil their clothes."

12. Both of them had a good laugh at this, and then Harry continued: "In New Zealand there are lakes of warm mud, and people do bathe in them. They roll about till they are plastered all over, and then they have it scraped off."

13. "Why is that, Harry?" said Madge.

"Dad says they are invalids, and they think that mud-baths will make them well. But it is tea-time now, Madge, and there is Mary looking for us." And off they scampered across the lawn.

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38. Waterfalls

1. Streams that run down mountain sides often come to precipices, over which they plunge with great leaps. These are called Waterfalls; and very pretty sights they make, with their glittering spray and white foaming waters contrasting with the dark mountain side, or with the green foliage of mountain forests.

2. But there are waterfalls quite away from mountains. A river may come to a drop of many feet in its bed; over this it falls with a roar, and sends up clouds of spray. Such are the falls on the Clyde, near Lanark.

3. One of these, named Cora Linn, is much admired. The huge rocks on its banks, crowned with trees or wild flowers, and the dashing waters, make a beautiful picture. Farther north in Scotland are the mountain Falls of Foyers, which are also very beautiful.

4. In England the best-known mountain falls are those of Lodore, in the Lake District. They owe their fame mainly to a poem written about them by Robert Southey.

5. At times a river comes to a steep slope in its bed. Down this it rushes wildly, dashing itself against rocks that stand up from its bed, and leaping up in great white-topped waves. Such places are called Rapids. The most famous rapids are those in the St. Lawrence, a couple of miles below the Niagara Falls.

6. Falls on great rivers are often called *Cataracts.* Along the river Nile, in Egypt, there are six great cataracts, which prevent the passage of large boats up stream, except when the river is in full flood.

7. It is extraordinary, to see how the Nubian boatmen will steer their craft down stream through these cataracts. It looks impossible

for boats to live in the wild waters, and yet the boatmen, by their wonderful skill and bravery, bring them safely through.

8. The great cataract of *Niagara* is one of the wonders of the world. A broad river connecting Lakes Erie and Ontario, between Canada and the United States, dashes over a precipice more than 150 feet deep.

9. Immense quantities of water pour over. Indeed, the great body of water, that flows out of Lake Superior and Lake Erie, must force itself over this fall to get to Lake Ontario, and so to the great river Saint Lawrence.

10. The Niagara river is 30 feet deep and half a mile wide at the fall, and the thunderous roar it makes, as it drops over the precipice, is heard miles away.

11. You will be interested to know that the great force of the falling water at Niagara is turned to a useful purpose. It is made to do work in driving engines, which give electric light to the towns on the banks of the river.

12. There is another great fall on the river Zambesi, in South Africa, but this is not so well known. It is called the Victoria Fall, and was named after Queen Victoria.

39. Plains and Plateaux

1. The high land in England is mainly in the west. In the east, as you can see on the map, there are great stretches without mountains. You must not think that these parts are quite flat. They often have little hills that are not considered important enough to be marked on a map.

2. Yet there is a great tract of land in the counties of Lincoln, Northampton, Huntingdon, and Cambridge, which is almost level. This is known as the Fens, and at one time it was almost entirely a marsh.

3 The Fens are almost at the same level as the sea;—some parts indeed are below sea-level—and, as a result, the rivers there run very slowly. So they are unable to drain the land of all the rain-water, and what they cannot carry off soaks into the ground. The sea also has helped to make the land swampy, by flooding it.

4. There are still swamps and great pools in the Fens, but a large part of it has been well drained by trenches like canals. Dykes, too, have been built to keep out the sea. So in place of swamps, there are now farms where fine crops of wheat are grown.

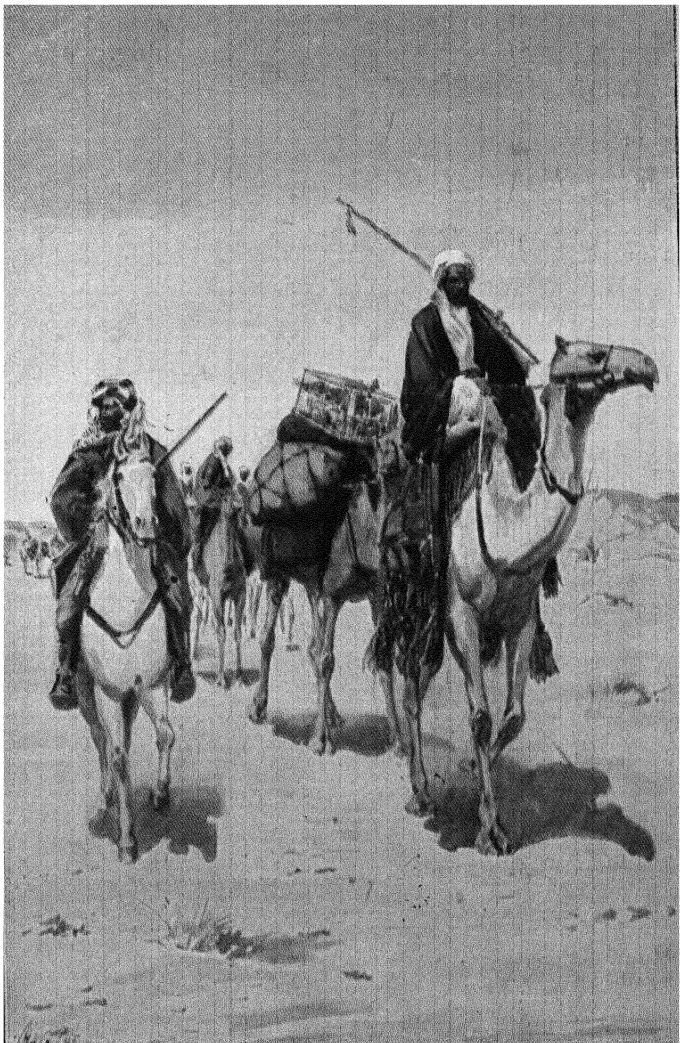
5. The swamps that remain are covered with tall grass, reeds, and rushes. These are the

homes of wild ducks, herons, and other birds, which afford fine shooting for sportsmen.

6. The large ponds, or meres and *broads* as they are called, are good places for fishing and boating. As they are generally shallow, in winter they are soon frozen over. Then the Fenmen take to their skates, and skate for miles, passing from one broad to another by the canals which join them.

7. Level, or nearly level, land like the Fens is called a Plain. The whole of Holland is a great plain, lower than the sea-level. In fact, if it were not that dykes have been built, the sea would flood most of the country.

8. Holland is a land of canals and ponds like the Fens, and Dutch people, both men, women,



CARAVAN CROSSING THE DESERT

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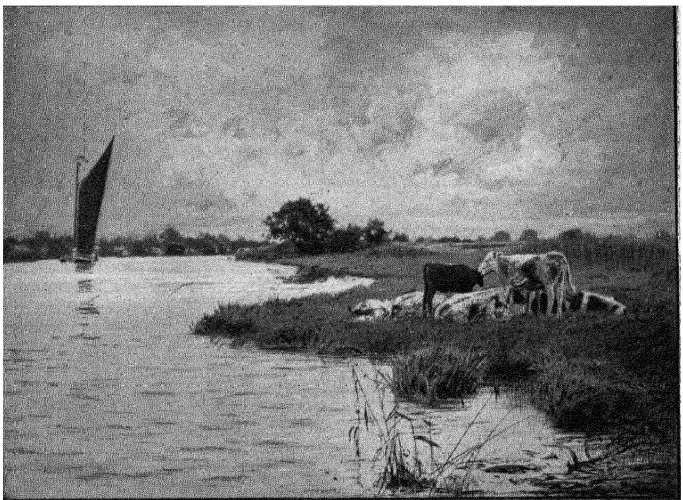

Scene on the Norfolk Broads

Balloon view of a Table-land

and children, are as famous skaters as the Fen-men.

9. A plain that stands high above the sea-level is called a Table-land or Plateau. The name table-land is given it, because a plain of this kind, raised above the sea-level, resembles the top of a table, which is, of course, raised above the floor.

10. Plateau is a French word meaning tea-tray. So you see that both names mean pretty much the same thing.

11. Salisbury Plain, in the south of England, is really a plateau, though it is called a plain. Its surface is not so level as that of the Fens, nor is its soil so good for farming.

12. At Stonehenge, on Salisbury Plain, there are some huge stones, each many tons in weight. They stand in a circle, and it is thought that they formed a temple in the far-off times when the inhabitants of England were heathens.

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40. Great Plains

1. There are other plains in England besides those already named. The centre of England is often called a plain, for the hills that cross it are of no great height. Dartmoor in Devonshire and Exmoor in Somersetshire are both table-lands.

2. As England is but a small country, none of its plains can compare in size with those to be

found, for instance, in Russia. In that country you may travel hundreds of miles without seeing either mountains or valleys.

3. The surface of the land is broken by a few low ranges of hills; but, except for these and the Ural Mountains, this great, flat, dull plain covers most of Russia, and of Siberia in the north of Asia.

4. In Russia the plains are called Steppes. Those in the north are barren, but the southern steppes are in many parts covered with large fine crops of wheat. In Siberia the name Tundras is given to these plains, and very cold and dreary they are.

5. Different names are given to these vast plains in different parts of the earth. In the United States and British North America they are called Prairies. These prairies stretch for hundreds of miles, and are generally covered with coarse grass.

6. Now and then a clump of trees is to be seen, or a pool of water. The grass on the prairie sometimes catches fire, and then the flames spread, and drive every living creature before them in terror.

7. At one time numberless bisons, or buffaloes, lived on the prairies. Now, all but a very few have been killed; and the land is being occupied by settlers, who raise fine crops of wheat from the rich soil.

8. In South America there are broad plains covered with grass several feet high. Those near the river Orinoco are called Llanos. Cattle and horses live on them in vast numbers. But there is no shelter from the driving storms that often occur, nor protection from the scorching rays of the sun, and therefore many of these poor animals die from exposure.

9. There are other great plains in the north of Brazil, near the Amazon. These have little or no grass, but are covered for hundreds of miles with tall trees. They are called Selvas. Creepers and climbing plants stretch from tree to tree, and bind the whole together, so that in places it is almost impossible to force a way through, even with axes.

10. Farther south, in the Argentine Republic, the grassy plains are called Pampas. Wild cattle and horses roam over these. In some parts of the world there are large plains, the soil of which is either stony or sandy, and without water. On these neither plants nor even grass will grow.

11. The greater part of Arabia is a plain of this kind, and, like all plains which cannot support plant life, it is called a Desert.

In the far north of America the plains are deserts covered with snow and ice.

In the west of the United States, near the Great Salt Lake, there are deserts, large parts of which are covered with salt.

41. The Sahara

1. A large portion of Northern Africa consists of a plain known as the Sahara, that is, the "Desert". This great desert is one of the most barren and desolate parts of the earth's surface. It stretches for hundreds of miles in every direction. It is nearly twenty-eight times as large as Great Britain.

2. Some parts of it are covered with stones; and vast stretches of sand occur, across which the traveller makes his way with difficulty. But on the whole, the aspect of the desert is varied. There are numerous fertile parts, and numerous ranges of hills cross the plateau.

3. The heat in the desert is overpowering. No cloud crosses the sky to screen the weary traveller from the rays of the blazing sun; while the constant glare of the dazzling sands makes the eyes ache, and almost blinds the sight.

4. There is a great silence, too, in the desert—a silence unbroken by the songs of birds, or the cries of wild beasts. In some places a lonely lizard may be seen crawling from its hole in the sand, or a vulture may be seen like a speck in the clear sky, but by other creatures the desert is shunned.

5. Rain hardly ever falls in the Sahara; and no cool breezes blow to refresh the few travellers

who cross the sandy wastes. Those who do cross the desert must carry their food and water with them. They must carry plenty too, for it takes about three months to cross the Sahara in its narrowest part.

6. Water is the greatest want of the travellers. They carry it in skin bottles, which are borne by camels. But sometimes the supply fails, and afterwards the travellers' bleaching bones on the sand alone remain to tell the pitiful story of their fate.

7. When people have to cross the desert they form themselves into a band and journey together. Camels carry their merchandise, food, and water; for horses would be useless. Such a band is called a Caravan.

8. The camel is well fitted for desert travelling. It has even been called the "Ship of the Desert". Its feet are great soft pads that spread out as it walks, and prevent its sinking in the sand. Its eyes are provided with long eyelashes, and its nostrils are so formed that they can close very tightly together. So the fine sand which blows about does not distress the camel so much as it would any other animal.

9. Then the camel can go for days, if need be, without water. Its sense of smell is very keen, and it can scent water from a long way off. So, though it is generally bad-tempered, always grumbling and growling, there is no animal so useful in the desert.

10. When a storm of sand approaches, the camels in the caravan utter a cry, kneel down on the ground and turn their backs to the storm, until the sand has blown past. The men of the caravan, too, throw themselves face downwards on the ground with their feet to the storm, as the best means of saving their lives.

11. In a few places in the Sahara a little water is to be found. A tiny spring bubbles up from the ground, and gives the water that is more precious than gold. In a few places, too, wells have been sunk.

12. Around these springs and wells a little grass grows, and generally a few palms, which give travellers shelter from the sun, and sometimes dates for food.

13. Such a fertile spot is called an Oasis.

These oases are the spots towards which the guides of a caravan make their way when journeying through the desert; for in them they find rest, shelter, and the water they so much need.

42. Map of England—Towns (Village, Hamlet)

1. "Do you see what that Master Harry is doing now?" said a ragged old jackdaw who had been for some little time perched on the poplar-tree. "I never saw anything so stupid in my life."

2. "I see nothing stupid," said the poplar. "All I can see is that he has what he calls a map of England, and it is covered with big and little black dots, which I heard him say are all the towns in the country. I think Harry exceedingly clever."

3. "That is because you are such a ridiculous old tree. You haven't been anywhere, and you haven't seen anything. Why, Master Harry has to learn the names of towns, and where they are and what they are like, from a map. I don't learn towns and places like that; I just fly over the country and see everything for myself."

4. "There, that is just what I always say; you are your father over again. He was the most

knowing jackdaw that ever came to perch on me; he had been everywhere and knew everything, and I think I learned a good deal from him."

5. "Pooh! What can an old tree like you know? Why, you never even saw a town, although you are about 900 years old."

"Now, come," said the modest poplar; "I am only 99 next Michaelmas, and I know what a village is, and what a hamlet is.

6. "That is a village over there where the church is. There is a long straggling street with a green in the middle where the children play, and I often hear their sweet voices. And there is the village shop, where they sell everything. I see them fetch from it tea and sugar, or a new spade, or a handkerchief or tie for Sunday.

7. "And there is the bakehouse chimney, and a little farther away are the mill and the smithy. Oh, how delightful it is when the wind brings the sound of the blacksmith's hammering! But that is what a village is.

8. "And there is a hamlet over there," continued the poplar. "There are only three or four little houses half-way up the hill. I think it is called a hamlet because it is not big enough to be called a village."

9. "Well, that really is not so bad for you: but I am sure that is all you know," said the jackdaw. And he laughed and chatted so, as he

Photo. Valentine

St. Paul's Cathedral, London

Photo. Valentine

In the Heart of London (Mansion House and Cheapside)

Photo. Valentine

CLARE COLLEGE, CAMBRIDGE

danced a kind of polka, that Master Harry looked up.

10. "Now, will you be quiet, you silly old jackdaw?" shouted Harry. "How can I learn the names of all the towns in England with that noise? If I catch you—"

11. "Oh, I know," said the jackdaw; "you will shut me up in that wicker cage again. I had to be very artful to get out when I did; and now I am out, I shall not be caught again in a hurry. Pray, go on with your map and the little black dots; I would not disturb you on any account."

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43. Inland Towns—A University Town and a Manufacturing Town

1. "Now you come to mention it," continued the jackdaw in his conversation with the poplar-tree, "I think my father was almost the wisest and most experienced jackdaw of his time."

2. "I am not sure about *wisest*," replied the poplar. "Your father certainly had travelled more than any bird I ever knew. You are nowhere in comparison with him."

3. "Oh, thank you! but I *have* been about a good deal. He took me to a good many places that I dare say you have never heard of. He took me, for instance, to see what a big city, and

what a country town and a manufacturing town, were like. He took me to London, and Cambridge, and Manchester, and other places."

4. "But I have heard of London and Cambridge too, and I think also of Manchester."

"Well, then," continued the jackdaw, "perhaps you can tell me where London is?"

"Oh no, I am afraid I cannot," said the meek poplar; "I cannot see so far as that, you know; but I believe I can see where it is on Harry's map. It is that big square dot, the biggest one of all."

5. "Well, but that is nothing like seeing the place for yourself, you know. My father said, 'Now, look here, my boy, I think a sight of Cambridge might be a little education for you.' And so we went.

6. "Cambridge was just what he said it was; a country town of about 40,000 inhabitants, that would not be of much importance, except for its great university and magnificent college buildings.

7. "It has some long, pretty, and clean streets, some fine old churches, a big square market-place, a fine hospital, and other buildings; but its great glories are the ancient chapels and libraries and extensive college buildings, and a pretty winding river, the Cam.

8. "Many of the jackdaws of Cambridge assembled together to meet my father and myself. They met on the roof of the Senate House,

coming from St. Mary's Church, from the University Library, and from the towers of some of the fine old colleges. They made grand speeches, but they were either in Latin or Greek, so neither my father nor I understood a word.

9. "This so enraged my father that he forgot himself, and said that, if that was 'book-learning', he did not want any of that for his boy; and, as you know he had been a sailor, he burst out with his sailor-talk, and called them 'land-lubbers'. Then they got angry, and we had to fly for our lives. The townspeople wondered whatever was the matter with the great school of jackdaws that afternoon.

10. "Then he took me on to Manchester. That is a big smoky town, not a bit like Cambridge. It was at least ten times as big, with a great many tall and smoky chimneys.

11. "But the great streets were full of busy people, and there was a great roar of carts and wagons, and trams and railways, which went on all day long, and trains were constantly coming to, and going from, the city.

"That was because it is a big manufacturing and trading town. I didn't like it, but my father seemed to like the noise and the smoke."

44. London—A City, a Seaport, a World's Market

1. "But you should just see London," continued the jackdaw. "Manchester is small in comparison with it, and there is not another city in the world that is anything like it. My father said so before we went, but when I saw it I was certain of it.

2. "We went some time after our visit to Manchester, and how can I ever forget it? We flew over miles and miles of streets till we came to a great building that was like a mountain, and we rested on the top of it, on a great golden cross.

3. "'This is St. Paul's Cathedral,' said my father. But I was far too astonished to speak, for I could see the streets and buildings stretching away everywhere. There seemed to be no end to them, but they appeared to pass right away into the sky all round.

"All the streets were full of busy people, but we were so high up that even the horses looked no bigger than jackdaws.

4. "And there was a great winding river, on which we could see hundreds of steamboats and ships of all sorts going to and coming from the sea. What I thought was a forest, my father

said was masts of ships from all parts of the world.

5. "When I could speak I said, 'What a wonderfully big place it is, and what a great roar all the traffic in the streets is making! Why, it is ten times as big as Manchester.'

6. "'Yes,' said my father, 'it *is* a wonderful city, the most wonderful city in the world. There are millions of people in it. It has, in fact, more people in it than some whole kingdoms. And it has the biggest trade of all the cities in the world.

7. "'It is a city and a port and a great manufacturing place, and what we might call the world's great market.

"'It is a port because the ships come up to its docks to unload their cargoes.

8. "'It is a world's market because goods are brought by ships from the most distant parts of the world to be sold in it. Its ships also carry out English goods to every country in the world.'

9. "I have never forgotten my visit to London. It was the grandest sight I have ever seen. It showed me what wonderful creatures men are, and what an energetic people the British are. I felt proud that I was a British jackdaw."

"And I am even proud to be a British-grown poplar," said the tree.

Harry was quite startled with a loud hurrah, but he did not know where it came from.

45. "Seaports", or Coast Towns, and Harbours

1. "When my father was a sailor," continued the jackdaw, "he saw nearly the whole world. At least, he went all round the British Isles, and that more than once."

2. "When you talk about your father having been a sailor, you say more than he ever pretended to be. He was only a sailors' pet jackdaw, and they clipped his wings so that he could not fly. Ha! ha! Didn't they?"

3. "What if they did, you disagreeable old poplar! That did not prevent his going everywhere with them; in fact, that was the reason why he did go. And he went till his ship was wrecked on the Goodwin Sands.

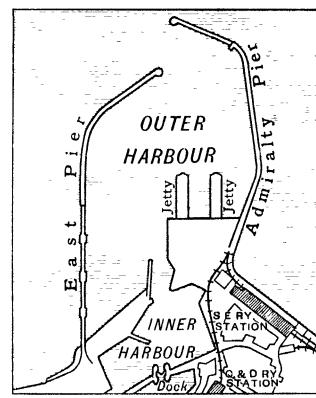
4. "Well, his ship went round and round to nearly all the *seaport* towns in Britain and Ireland. He was most often at Liverpool; but he went also to Glasgow, Belfast, and Bristol, Portsmouth, Plymouth, London, Hull, and Newcastle-on-Tyne. He went even as far north as to Dundee and Aberdeen.

5. "What is a seaport town? Well, of all the ignorant old trees, I think you are about the worst I know. I consider you quite wooden. I thought you learned so much from my father."

"So I did. But then, you see, I dared not ask

many questions, because he used to get into such a temper."

6. "Well, if you really wish to know, a seaport town is a town which is so near the sea, that ships can come to it, and unload the goods which they have brought. But a seaport must have a Harbour, or a place in which ships are safe from storms.



Plan of a Harbour (Dover)

7. "Often the mouth of a river forms a harbour where the ships can lie in safety. Many harbours are openings in the land made by the sea, something like large ponds; but they are never closed in all round by the land, but have always a passage leading to the sea.

8. "I have seen some harbours with narrow entrances, and they were good harbours, for the water in them was always calm; but there are others with wide entrances. These would not be so good, but men build thick walls of stone, called Breakwaters, across part of the entrance: and the waves of the sea dash at these and try to climb over."

9. "Ah, what a thing it is to be able to fly!"

said the poplar sadly. "I wish I were a bird, that I might go and see the world, but I'm afraid I shall always have to stay at home." And he gave a big sigh that made his leaves quiver again.

10. "Poor fellow!" said the jackdaw. "Can't you pretend you're an oak, or even a pine, and then you might be used for some part of a ship and get a chance to travel." The poplar shook his head and said he was too old to learn new ways; besides, he did not like pretending to be anything but what he was.

11. "Well," continued the jackdaw, "most of the seaports have what are called *docks*. These are large pieces of water surrounded by strongly-built walls, in which ships can lie safely, and put out their cargoes, and take in fresh ones. Why, I've seen miles and miles of docks at London, Liverpool, and Glasgow, and there are sometimes hundreds and hundreds of ships in them all at once."

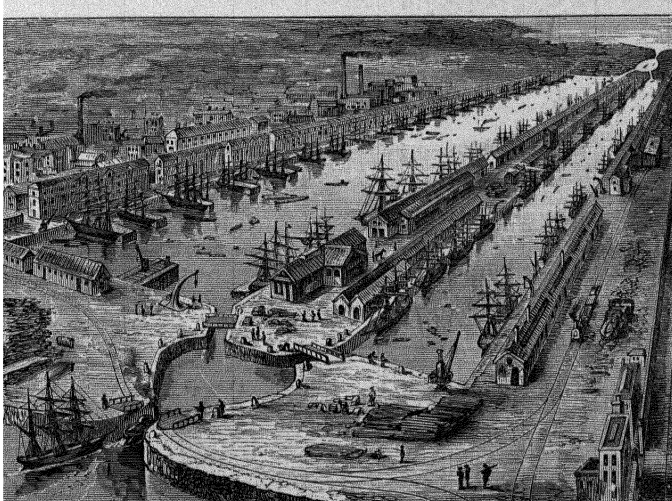
12. "Dear me!" said the poplar-tree. "I am beginning to think that you really know almost as much as your father did."

"I expect to know quite as much if not more than he did by the time I am *his* age. How old was he when he died, do you think?"

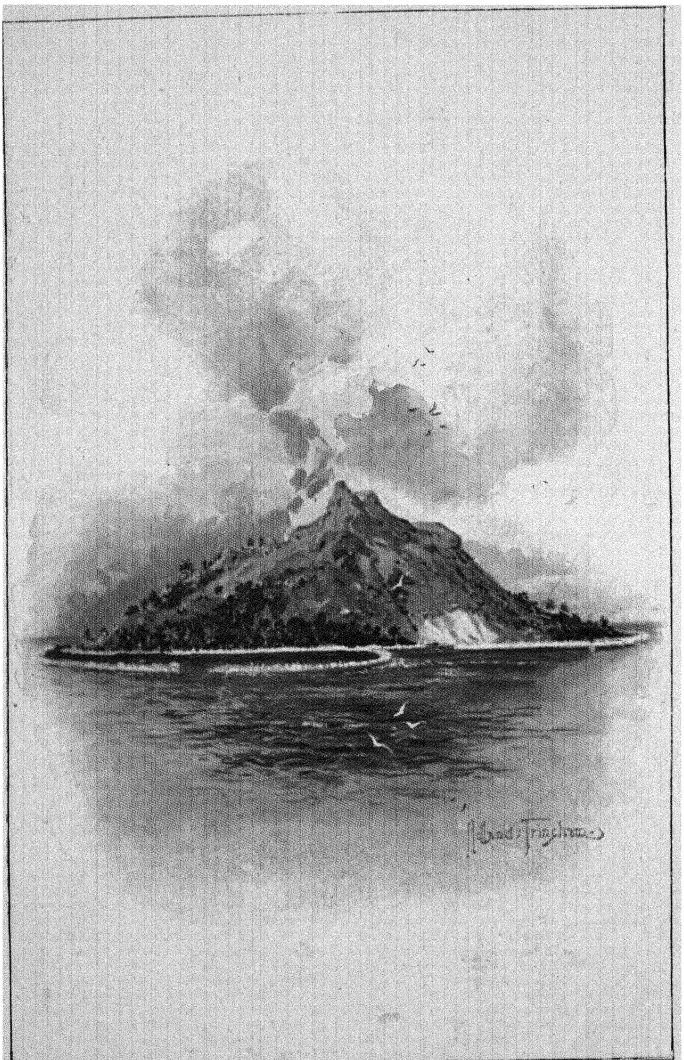
13. "He used to tell me he was about 120 long before he died. But he must have been very old, because when I first invited him to perch on me he said, 'What impudence! I never perch on

Photo, Fincham

Dover Harbour



West India Dock, London



A CORAL ISLAND

trees so young as you are!' And it was years after before he really did so."

14. "I never heard such a chattering as you continue to make up there," said Harry, as he gathered up his books and his map. "I really must finish my lesson on seaports indoors."

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46. The Work of the Waves.

1. At Margate, on the east coast of England, even a blind man could not stand long on the beach without noticing that the sea is always at work. Every wave rolls up pebbles, which rattle down as the wave retires.

2. In this way the pebbles are made smooth and round. Little by little they are worn away to little bits that are really coarse sand, and this in its turn is ground down to a fine dust. Take a handful of sand, and you can see that it consists of very tiny bits of stone.

3. In many parts of England the sea-shore does not slope down to the water and form a beach. The land at its edge dips down sharply, perhaps many feet, to the sea, forming what is called a Cliff.

4. At Margate, behind the beach, there are cliffs of chalk, and there are many other chalk cliffs on the south and east of England. From time to time portions of these cliffs are loosened

by rain and frost, and fall down to the edge of the sea.

5. The waves of the sea use these pieces of rock, as hammers to beat against the face of the cliffs. Even in calm weather the tide sweeps these broken portions with great force against the cliffs, of which they once were a part.

6. In a gale the force of the waves is tremendous, and tosses huge masses of stone about like playthings. You can understand this better, if you remember that the weight of things is less in water than in air.

7. If this is new to you, there is an easy way to make sure of its truth. Next time you go for a swim lift your arm out of the water. You will notice that as it comes out it seems to get heavier.

8. Well, the sea keeps hammering away at the shore, day by day, and year by year. Where the shore is made of soft rock or earth, it sweeps away sometimes large portions.

9. When the coast is hard rock, the sea pounds away at it with hammers of stone, till the softest parts are worn away.

10. Great rocks are left standing up in the sea, with narrow passages of water, like streets, cutting them off from one another, and from the land. The sea also hollows out tunnels and caves in the cliffs.

11. Now you can understand, why the coast

of England is marked on the map by a crooked line. You will see, too, that it is more crooked on the west than on the east. That is no doubt due to the fact that the west coast has greater stretches of hard rock.

12. But if you wish to see more plainly the work of the sea, look at the west coast of Scotland. The sink of the coast-line, and the work of the waves on the high and hard parts left standing above the level of the water, have carved out there bays of every shape and form.

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47. Islands

1. The sea often bores inland, and works its way round large pieces of land, cutting them off and surrounding them with water. Pieces of land like these, with water all around them, are called Islands.

2. There is a well-known island near the south coast of England. It is the Isle of Wight, and you can see that the sea has made a passage which separates the island from the mainland of which it once was a part. It is a very pretty island, with several pleasant towns on it, which in the summer-time are full of visitors on their holidays.

3. Many islands of all shapes and sizes have been made in this way. On the West of Scot-

land there is a large group of some hundreds, called the Hebrides. The larger islands in the group have towns and villages on them, but others are only rocks, large enough to make a home for sea-birds.

4. There are often islands in rivers, as, for instance, in the Thames. These are built up of the earth that the river carries in its waters. At places where the speed of the stream slackens, some of this earth sinks to the bottom, and little by little a heap is formed, which at length pushes its top above the water.

5. Islands have been formed suddenly in the sea; but this has only happened at the time of earthquakes, or of the eruption of some great volcano. Islands of this kind often vanish just as suddenly as they appeared.

6. England, Wales, and Scotland form an island which is called Great Britain. In the middle of the Irish Sea there is a beautiful island called the Isle of Man. But you will easily find numbers of islands on the maps, for there are many thousands of them.

7. The largest island in the world is Australia, and that belongs to Britain. It is fifty times the size of England, but it has not nearly as many people in it as there are in London.

8. There is a large island on the east of Africa called Madagascar. This now belongs to the French, who seized it a few years ago. It is

not a healthy place to live in, and the French troops lost more men from fevers than from fighting.

9. Ceylon, to the south of India, is another large island, which is in the hands of the British. It supplies a great deal of the tea and coffee that are sold in the grocers' shops in our country.

10. A large group of islands is often called an Archipelago. The meaning of this long name is the "chief sea", and properly it is the name of that sea which lies between Greece and Asia Minor. As that sea is crowded with islands, the name has, in some way or other, been applied to island groups.

11. Besides the Greek Archipelago, there is a much larger one to the north of Australia, which is known as the Malay Archipelago. In this group are the Philippine Islands, which the United States of America took in 1898 from Spain.

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48. Coral Islands

1. In the warm waters of the Pacific and Indian Oceans there are to be found many islands rising just above the surface of the water. Their shape is peculiar, and is generally something like that of a large flat ring or a horse-shoe.

2. The waters of the ocean surround the island, while in the middle of it there is a round pool

of green water, which contrasts, in a very striking manner, with the whiteness of the beach around. The pool in the middle of the island is called a Lagoon.

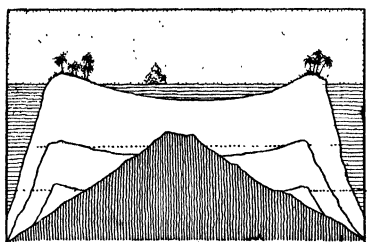
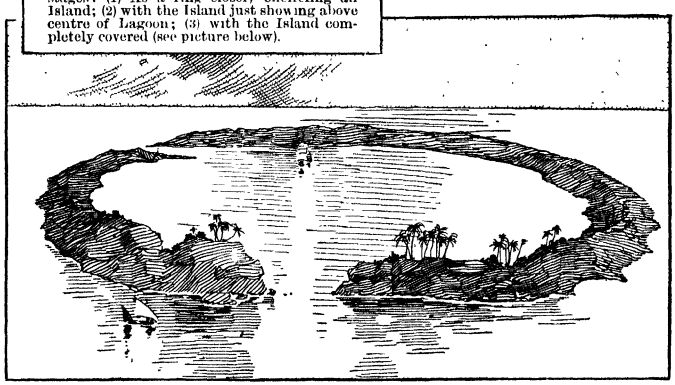


Diagram showing how a Coral Island is formed. The coral-growth is shown at three stages: (1) As a ring closely encircling an Island; (2) with the Island just showing above centre of Lagoon; (3) with the Island completely covered (see picture below).

3. Cocoa-nut palms generally grow round the island like a fringe, so that, seen from the sea, the island seems to be only a ring of tall trees, rising directly from the water. An island like this is called an Atoll, or a Coral Island.



Picture of an Atoll

4. It has been formed in a wonderful way by colonies of little sea-creatures. These tiny animals live together in vast numbers. They

do not swim about in the water like fish, but remain fixed in one place, with their bodies joined together in such a way as to form one huge mass or colony. There is in each colony a kind of framework or skeleton of limestone, and this is strong enough to withstand the beating of the waves.

5. Against whatever shores the warm currents of the ocean flow, there these coral-builders are to be found; for they depend for their food on the still tinier creatures which are carried along by the warm water.

6. At the top, or crown, of the coral polyp there are a number of tiny feelers, which can be thrown out or drawn in by the little creature at pleasure. It is by these that food is seized as it is floating by.

7. In cold water the coral-builders would die. It has been found, too, that they cannot live in warm water at a greater depth than about a hundred feet.

8. Sometimes, instead of a ring, they form a bank of coral, which is called a Reef. The largest coral reef in the world is the Great Barrier Reef, off the east coast of Australia. It is more than twelve hundred miles long, and is in places from ten to ninety miles wide.

9. Men who have studied the subject tell us that when the coral reefs were begun they encircled islands, which were gradually sinking

into the sea. But just as fast as the land sank, so the coral-builders raised their reef.

10. Thus, when at last the land sank quite below the surface of the sea, the coral reef surrounded it like a ring. The part where the land was formerly is now occupied by the lagoon.

11. We cannot tell exactly how many coral islands there are, but we know they amount to several thousands in the warm waters of the Pacific and Indian Oceans. One part of the Pacific to the east of Australia has so many of them that it is known as the Coral Sea.

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49. Peninsulas

1. "A Peninsula is—let me see, Madge; a peninsula is—oh, I know, a piece of land that juts or stretches right out into the sea, with water nearly all round it."

"Really, Harry!"

"Well, let us look at India now. Dad says that is a peninsula, and a very big one. But where is India?

2. "I think I can find it, because that is where the ancient mariners wanted to go to by sea before Columbus found America. Well, he went west, and they wanted to go east. Madge, I believe we shall find it."

Photo. Frith

LAND'S END

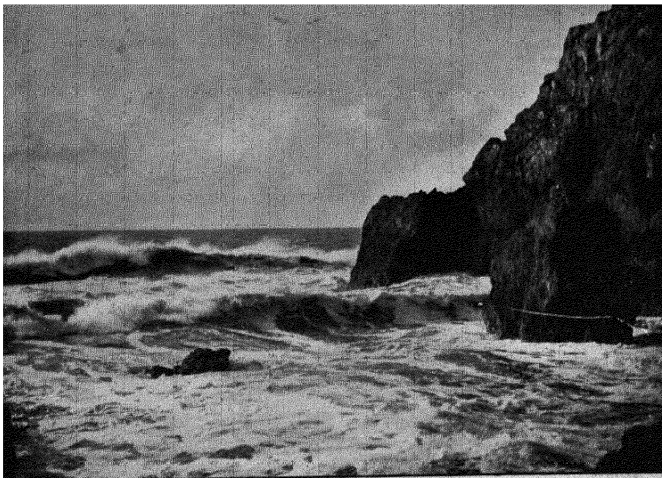


Photo. Worsley-Benison

The Waves and their Work

Photo. Valentine

The "Old Man of Hoy" (Orkney Islands,

3. So they looked to the east on the map, and saw where Asia was, and then Harry shouted "Hurrah, here's India!" Then they saw that India was a great piece of the continent of Asia stretching out southwards into the Indian Ocean, and that the sea ran up both sides of it.

4. "There! There's a peninsula if you like, Madge. I should say that is more than a thousand miles long. Why, look, it is ever so many times bigger than the whole country we live in, that is, Great Britain. Fancy that, Madge,—a jutting-out piece of land as big as that!"

5. "I can see others," said Madge. "I can see a big one, east of India, and it stretches away much farther than even India does."

"Of course there are others; and this one you have found is called Further India.

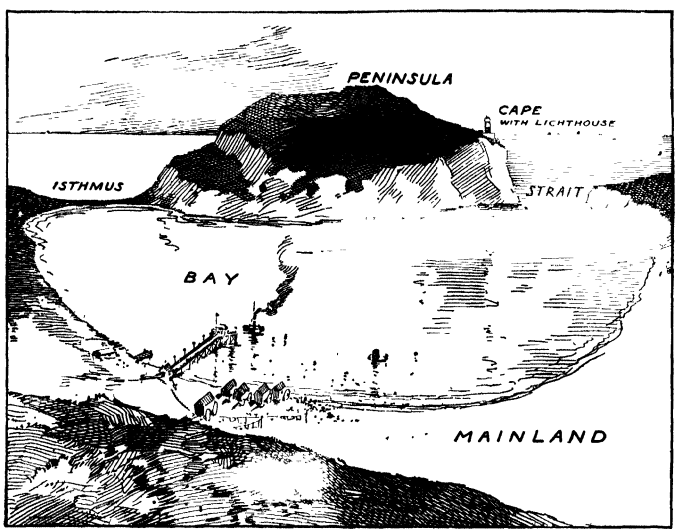
6. "But Dad says I am to find out several in Europe. They are on this paper—Italy, Spain, Norway and Sweden.

"Now, Madge, where is Italy? Here it is, we could hardly miss it; it is like a boot with an island at the toe."

7. "It is easy enough to see that that is a peninsula," said Madge. "I should have known that all by myself."

"Look, here is Spain, Madge! But that does not look so much like a peninsula; yet as the sea goes almost all round, it must be one, and besides, Dad says it is.

8. "Let me see, now we want Norway and Sweden. Here in the very north of Europe. See, Madge, that peninsula stretches from the Arctic Ocean into the North Sea; and this narrow strip of water that runs up the east side



Coast Scene—low tide. (See also page 167)

of it is the Baltic Sea. What a big peninsula it is for Europe!"

9. "Harry, here is another smaller one just below it, stretching north!"

"So there is, Madge, and that is marked Denmark.

"If this little bit of land were cut through that joins it to Europe, then Denmark would be an

ARCTIC OCEAN
Nova Zembla
North C.
C. Nordkyn
Iceland
Reikjavik
Mt. Hekla
Faroe Is.
Lapland
Siberia
Ural Mountains
Petchora
N. Dvina
L. Onega
L. Ladoga
Neva
Scandinavian Range
G. of Bothnia
L. Maelar
Wener
Wetter
Gotland
Skaw
Skager Rack
The Skaw
SWEDEN
DENMARK
Zealand
Fuhnen
Laaland
Bornholm
English Miles
0 50 100 200
Malin Hd.
Erris Hd.
Tay
The Naze
BRITISH ISLES
IRELAND
SCOTLAND
North Sea
DENMARK
Baltic Sea
R. Volga
R. Dvina
Vistula
R. Oder
R. Elbe
R. Weser
R. Rhine
R. Meuse
GERMANY
RUSSIA
Severn
Lands End
English Chan.
La Hogue
Negropont
GREEK ARCHIPELAGO
0 50 100 Miles
C. Ortegal
C. Finisterre
Bay of Biscay
FRANCE
R. Loire
R. Seine
L. Constance
L. Geneva
Mt. Blanc 15784
R. Rhone
R. Garonne
Pyrenees
AUSTRIA-HUNGARY
Carpathians
Dniester
R. Dnieper
R. Don
R. Volga
Caspian Sea
Caucasus Mount.
Mt. Elburz 18672
Black Sea
Sea of Azof
Danube
ROUMANIA
SERVIA
BULGARIA
Balkans
TURKEY
Azores
C. Roca
C. S. Vincent
C. Tarifa
Str. of Gibraltar
Castilian Mts.
Lagus
Guadiana
Guadalquiver
S. Nevada
Portugal
Spain
Balearic Is.
G. of Genoa
G. of Lyons
Corsica
Sardinia
Adriatic Sea
Apennines
Sicily
C. Spartivento
Malta
C. Matapan
Crete
Cyprus
Dardanelles
Sea of Marmora
Constantinople
Archipelago
MEDITERRANEAN SEA
AFRICA
ATLANTIC OCEAN
EUROPE
English Miles
0 100 200 400 600

island. And I remember Dad said that peninsula meant 'nearly an island'."

10. "Oh, then England is a peninsula, Harry, because it has water nearly all round it."

"So it is, Madge. That one we have found out for ourselves. And see, here's another in Scotland called Cantire.

"There, I don't think that is at all bad!" said Harry, rather proud of himself.

"No, it is just splendid!" said Madge.

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50. Isthmuses

1. "I am going to show you what an isthmus is, Madge, and then Dad says that I shall almost have done with the land for the present. He doesn't know how splendidly you are getting on. He will have a surprise some day, will he not?" And they both laughed at what they thought to be great fun.

2. "But really, Madge, there must be a great deal to learn about the world. Dad says I know very little yet, and I thought I should have finished it all by this time.

"Now then for the isthmus, Madge! Listen:

"An isthmus is a narrow portion or neck of land which joins two larger portions together. Do you understand that, Madge?"

3. "I think so, Harry. Only I should know

better what is meant if I saw a—a—a what-do-you-call-it on the map."

"Really, Madge, it is not a what-do-you-call-it—it is an isthmus. Dad told me that the word isthmus means neck; and that just as the neck is the narrow part between the head and the body, so an isthmus is a narrow part of land between two larger parts."

"I'll remember, Harry," said his sister.

4. Harry then placed his finger on the Isthmus of Suez. "There, Madge, look at that," said he; "that is a very fine isthmus connecting Africa with Asia.

5. "Now, is it not a good one, Madge? If it were not for that little connecting bit of land Africa would be an island—the biggest island in the world."

"Oh, I think it is just a beauty, Harry!" said Madge.

6. "Just think; it is as good as an island now, for a big ship-canal has been dug right across from one sea to the other. It goes from the Mediterranean to the Red Sea, and the Red Sea goes straight into the Indian Ocean, and the Indian Ocean leads to—to—oh, everywhere else.

7. "But I know another good one, Madge, even better than the Isthmus of Suez; I mean the Isthmus of Panama. It is a slim neck of land that joins North and South America together."

8. "Oh well, I believe I could find that, Harry!" And so Madge did, almost immediately.

"Of course you could find that, Madge. Isn't it a good isthmus? It looks as if anyone could cut it with a pair of scissors and let South America fall right down.

9. "But of course it would not fall down if you did cut it. And you certainly could not cut it with scissors, for it is miles and miles across that narrow little bit.

10. "Dad says there will be a ship-canal through the Isthmus of Panama some day, and then South America will be an island too."

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51. Capes

1. When we look at a map of Great Britain, we cannot fail to notice how uneven the coast-line is. In some parts the sea runs up into the land, forming openings, and between these the land juts out into the sea. The pieces that jut out are called Capes and Headlands.

2. There are hundreds of them in England alone, but only the biggest are marked on the map. There is a fine one in Yorkshire called Flamborough Head. It is a high rocky cape, and in former times was used as a beacon.

3. Large bonfires were lighted on it to give

warning to ships at sea. Now bonfires are not needed, for a lighthouse on the top of the cliff casts its light far over the waters, and acts as a guide to sailors out at sea.

The base of the cliff has been worn into caves by the beating of the waves, and much of the land along the coast near Flamborough Head has also been swept away.

4. The most easterly point of the coast of England is Lowestoft Ness. The word "Ness" is another form of the word "nose". Many capes are so called because they stand out from the coast, just as a man's nose stands out from his face.

5. One of these is called simply the Naze, which means the same as "Ness". It lies on the north side of the Thames estuary. There are various names given to capes. For instance, there is the Lizard in the south of England.

6. Some capes are called Points, like Start Point in Devonshire; and there are two in Kent called the North and the South Foreland. In Scotland the word "Mull" is sometimes used. Besides all these, the name Promontory is often given to lofty capes; but it is not used in maps.

7. In the far south-west of England is Land's End, a very well-known cape. As the coast there is very rocky, and the sea seldom calm round Land's End, it is a very dangerous part of the coast for ships.

8. Indeed, no part of the English coast is more dreaded by sailors, and many a fine ship has become a wreck in the wild breakers that beat on the rocky shores of Cornwall. The famous Eddystone Lighthouse is off the Cornish coast. It stands on a low rock, which had proved fatal to many ships before the lighthouse was built.

9. The coast of Scotland is remarkable for the number of its capes and inlets. Most of them are on the west coast. This is what we should have expected, because the waves of the Atlantic are rougher, and storms are more frequent in that ocean than in the North Sea on the east. In the north is Cape Wrath, a lonely and rocky cape, not at all beloved by fishermen.

10. There are some famous capes in other parts of the world. Cape Horn, the extreme point of South America, is one of them. In olden times it was much dreaded by sailors. Tempests of wind, rain, hail, and snow drove back their sailing-ships, and made the passage round it very difficult indeed. Even now, for large steamers, the passage round Cape Horn is not easy nor without danger.

11. In the south of Africa is the Cape of Good Hope. A large town near it, called Cape Town, is a very important place, at which most of our ships call when they are sailing round the south of Africa.

SCOTLAND
Physical features & chief towns.
Westray
Pomona or Mainland
Orkney Islands
Hoy
Sth. Ronaldsha
Pentland Firth
Dunnet Hd.
Duncansby Hd.
C. Wrath
Butt of Lewis
Wick
NORTH SEA
Loch Shin
Dornoch Firth
L. Broom
Tarbet Ness
Ben Wyvis
Cromarty Firth
Moray Firth
Kinnaird Hd.
L. Maree
Elgin
Cairn Edge
Peterhead
Buchan Ness
L. Beauly
Culloden Moor
R. Deveron
Inverness
Loch Ness
R. Spey
R. Findhorn
Cairngorm Mts.
R. Don
R. Dee
Aberdeen
Cuillin Hills
Mam Soul
Caledonian Canal
Carntoul
Ben Macdhui
Rum I.
Eigg
Sleat
Lochy
Grampian Mountains
L. Ericht
Pass of Killiecrankie
Ben Nevis
Brechin
Montrose
Ardnamurchan Pt.
Coll
Tiree
B. More Mull
Staffa
Iona
Firth of Lorne
Colonsay
Oronsay
L. Awe
Ben More
Strathmore
Sidlaw Hills
Forfar
Arbroath
Bell Rock
Firth of Tay
Ochil Hills
Fife Ness
Isle of May
Bass Rock
Firth of Forth
Kirkcaldy
Stirling
Dunfermline
Leith
St. Abbs Hd.
Falkirk
Airdrie
Edinburgh
Glasgow
Paisley
Coatbridge
Motherwell
Hamilton
Pentland Hills
Lammermoor Hills
R. Tweed
Kilmarnock
R. Clyde
Broad Law
Cheviot
Ayr
Lowther Hills
Hart Fell
Hawick
Rathlin I.
Mull of Cantyre
Ailsa Craig
L. Ryan
Mt. Merrick
R. Nith
R. Annan
Cheviot Hills
IRELAND
ENGLAND
Luce Bay
Wigtown Bay
Solway Firth
Mull of Galloway
Burrow Hd.
ATLANTIC OCEAN
Little Minch
The Minch
North Channel

52. Bays

1. "A bay is only a big dent in the land, Madge. A bay does not usually run so far into the land as a gulf.

"Dad laughed when I said they were only big dents in the land, but he said that description would do very well.

2. "Most big dents or curves in the outline of the land are bays, although from what I saw I do not think they are always called that.

3. "Now, I have to look out the bays in the West of England and Wales and around Ireland. That is what Dad says; and then all over the world if I like. So you had better pay great attention, Madge, and be careful not to ask too many questions.

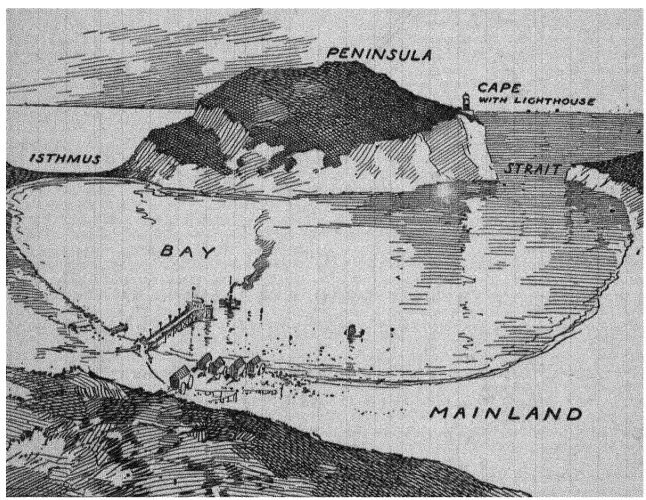
4. "Well, I can see Luce Bay and Wigton Bay, but they are in Scotland; and lower down, Morecambe Bay. Then in Wales I see Carnarvon Bay, and a fine big one, Cardigan Bay. Then St. Bride's Bay, Carmarthen Bay, Swansea Bay. On the south side of the Bristol Channel there are Bridgwater Bay, Barnstable Bay, and at the end of Cornwall, Mount's Bay."

5. "Oh, Harry, you have missed one! See, there is Milford Haven."

"So I have, Madge; it must be a bay although it is called a haven. But I remember Dad said

that some are called harbours, like Portsmouth Harbour on the south coast.

6. "There are many little bays all along the coast. Dad says that almost every little opening into the land is called a bay. You called them



Coast Scene—high tide. (See page 158)

'big dents', Dad said to me, and people who like big words often speak of them as 'indentations'.

7. "Do you know what a bay is now, Madge?"

"I should think I do, Harry."

"Well now, we have to go all round Ireland. Here they are!—Dundrum Bay, Dundalk Bay, Dublin Bay. These are on the east, and on the west there are Bantry Bay, Dingle Bay, Tralee

Bay, Galway Bay, Clew Bay, Donegal Bay, and a good many others; but I should think that is enough."

8. "It is enough for me," said Madge.

"That will not do, Madge. We have to go all over the world yet; but I will let you off easy if you pay great attention.

9. "Well, there is the Bay of Biscay. I should think you know that, Madge, because you have heard Dad sing that song where it comes in:

> "'There we lay all that day
> In the Bay of Biscay O!'"

10. "Oh, I should like to see that!" said Madge.

"There it is, then; it is big enough, isn't it? But I know a bigger one, and that is the Bay of Bengal there. That is something like a bay.

11. "There is another name for a bay, a funny one too. Oh, I remember,—it is bight."

"That is funny, Harry," said Madge with a laugh. "I suppose it is called so because the sea has taken a bite out of the land."

"Now it is not spelled that way, Madge. You really ought not to be so funny. It is b-i-g-h-t, not b-i-t-e. Look, here is one south of Australia, called the Great Australian Bight.

12. "Then there is the Bay of—the Bay of—I cannot find any more big ones. There are lots of dents and curves and bends in the land, but they are not called bays. But I am sure there

are thousands of other smaller bays in the world. So think of that, Madge."

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53. Gulfs

1. "Do you remember, Madge, what a peninsula is?"

"Of course I do, Harry. It is a piece of the land with water nearly all round it."

"Well then, Madge, a gulf is the name usually given to a piece of water with land nearly all round it, or stretching right away into the land."

"If that is what a gulf is," said Madge, "let me see if I can find one."

2. After looking for some time on the map of the World, Madge found the Gulf of Bothnia, on the north of the Baltic Sea. Then Harry pointed out the Gulf of Finland and the Gulf of Riga, both to the east of the Baltic Sea.

3. Harry could not find many gulfs marked, and none at all in England; but he said he thought the Adriatic Sea and the Red Sea would both have been called gulfs if they had not been big enough to be called seas.

4. "But there are other gulfs. There is the Persian Gulf, and there is a big one on the north of Australia, the Gulf of Carpentaria; and of course there are others."

5. "Well, I call that ridiculous of you, Harry,

to miss out the biggest gulf in the world. You have not mentioned the Gulf of Mexico."

"Dear me," said Harry, "I cannot think how I forgot that! But who told you about the Gulf of Mexico, Madge?"

6. "I have been spelling it out on the map," said Madge, "and—"

"And not paying any attention to me," said Harry in a very severe tone. "Now, where is the Persian Gulf, Madge?"

7. "Oh, Harry, I was spelling this out all the time; but I think you said it was in the Adriatic Sea."

"Well now, Madge, really! Fancy wasting time like that. The Persian Gulf is in Persia, isn't it? And where is the big gulf in Australia?"

8. Madge's quick eye enabled her to put her finger at once upon that. So Harry merely said, "Now don't let that sort of thing occur again, Madge."

Madge wiped just one tear out of her eye, and said she would listen to every word next time.

9. "Very well, Madge. Of course I ought to have remembered the Gulf of Mexico, because Dad says that it is not only the biggest, but is the best-known gulf in the world. I cannot see much difference, though, between a bay and a gulf. Can you, Madge?"

10. Just then Harry caught sight of his dog

Towser chasing a rat. He did not stop for Madge's answer, but scampered off, forgetting all about gulfs and bays in his hurry.

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54. Channels, Estuaries, "Mouths", Firths, Loch, &c.

1. "What puzzles me is this," said Harry, after looking all round the shores of England and Scotland; "why things that are alike are not called by the same name. It seems to me that they call the same thing by different names all round the map."

2. "Whatever do you mean, Harry?"

"Well, on the west of England there is a big opening into the land that I should have thought might have been called a gulf. But it is not, it is called a 'channel', the Bristol Channel.

3. "Then, on the east side of England is another big sort of gulf very much like the Bristol Channel, and that, Dad says, is called the Mouth of the Thames, or the Estuary of the Thames. And when I went farther up the east side of England, I came to another opening in the land, and that was named The Wash, which Dad says is also a big estuary.

4. "Then, farther north, was the 'mouth' or 'estuary' of the Humber, and then came the

mouths or estuaries of the rivers Tees and Tyne.

"I thought I was getting on splendidly, and rushed up the side of Scotland, and I said, 'Oh, here is a big estuary, Dad; and another, and another!'

5. "'But wait a minute, Master Harry,' said Dad; 'kindly see what they are named.' And when I did so, they were called *Firths*. There was the Firth of Forth, the Firth of Tay, the Moray Firth, and down the west side the Firth of Lorne, the Firth of Clyde, and the Solway Firth. What do you think of that, Madge?"

6. "But what is the difference?" asked Madge.

"Well, there doesn't seem to be any difference. Dad said they were estuaries all the same; they only go by different names in different parts of the country.

7. "But that is not all, Madge. I found that a good many of the long openings of the sea into the land, on the west coast of Scotland, are called 'lochs', such as Loch Fyne and the Gairloch. Then, when I came to Ireland, it was pretty much the same. There they were called 'loughs'. There was Lough Foyle, Belfast Lough, and others

8. "But why they are not all called bays, or something sensible, I cannot make out," added Harry. "Dad says they can all be called bays, or firths, or estuaries, if we like.

IRELAND
(Physical.)
North Channel
Malin Hd.
Horn Hd.
L. Swilly
Bengore Hd.
Rathlin I.
Tory I.
Bloody Foreland
Benmore or Fair Head
Slieve Snaght
Errigal
Arran I.
Mts. of Antrim
R. Foyle
R. Bann
Northern Plain
Lough Neagh
Belfast L.
L. Strangford
Mts. of Donegal
Malinmore or Teelin Hd.
Donegal B.
R. Erne
L. Erne
Upper L. Erne
Erris Hd.
Killala B.
Sligo B.
Mourne
Slieve Donard
Mts.
Dundrum B.
Nephin Mts.
Mt. Nephin
Blacksod B.
Achill Hd.
Achill I.
L. Conn
R. Moy
L. Allen
R. Erne
R. Shannon
Carlingford L.
Dundalk Bay
Dunany Point
Clare I.
Clew B.
Croagh Patrick
Inishturko
Inishboffin
Inishark
L. Mask
Connemara Mts.
Twelve Pins
L. Corrib
The Great Central Plain
R. Ree
R. Boyne
Lambay I.
Irelands-Eye
Howth Head
Dublin B.
Dalkey I.
Slyne Hd.
Galway B.
Black Hd.
South Arran I.
R. Shannon
R. Liffey
Bog of Allen
Wicklow Mts.
Wicklow Head
Slieve Bloom Mts.
L. Derg
R. Barrow
R. Slaney
Mt. Leinster
Cahore Pt.
Blackstairs Mts.
Loop Hd.
Mouth of the Shannon
Kerry Hd.
Silver Mine Mts.
R. Suir
R. Nore
Galty Mts.
Galtymore
Knockmealdown Mounts.
Wexford Harbour
Greenore Pt.
Carnsore Pt.
Mt. Brandon
Dingle B.
Lakes of Killarney
R. Blackwater
Dungarvan Harbour
Hook Hd.
Waterford Harbour
Tramore B.
Helvick Hd.
Dunmanus Bay
Carrantuohill
Macgillicuddy Reeks
R. Lee
Youghal Harbour
Ram Hd.
Bolus Hd.
Mts. of Kerry
Kenmare R.
Valentia I.
Crow Hd.
Bantry B.
R. Bandon
Ballycotton Bay
Roche's Pt.
Cork Harbour
Kinsale Harbour
Old Hd. of Kinsale
Mizen Hd.
C. Clear
Clear I.
St. George's Channel
ATLANTIC OCEAN
IRISH SEA

9. "Oh, very well," I said to Dad, "when I am a man I shall make new maps of everywhere for everybody. I shall call all the openings of the sea into the land, bays, and then they will give no trouble, will they, Madge?"

"Bravo, Harry!" said Madge; "that *will* be fine!"

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55. Straits

1. "Oh, what a muddle I got into over my last lesson, Madge! Dad gave me an outline map of the British Isles on which there was not a single name, and told me to put in the names of the principal openings of the sea into the land. I called the Humber a 'loch', and the Moray Firth the Moray 'Mouth', and so I had to study the map again.

2. "But this next one is very easy, Madge. This one is about *Straits*.

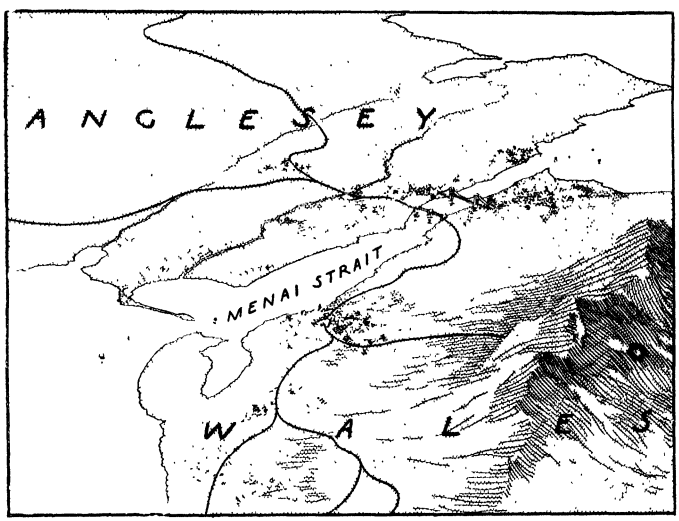
"Do you remember what an isthmus is, Madge?

"Yes, Harry, of course I do; it is a narrow neck of land which joins two larger pieces of land together. I remember that, because we talked about cutting it with scissors;" and they both laughed at the remembrance.

3. "A *strait* is something like an isthmus, only it is water. It is a narrow neck of water joining two big portions of water together.

4. "If we look at the map of Europe, we shall see that the North Sea is joined to the English Channel by a narrow neck of water between England and France. That is called the Straits of Dover.

5. "But Dad says a wide passage which joins two big portions of water is often called a



View of Menai Strait

channel. And he showed me St. George's Channel and the North Channel, which connect the Irish Sea with the Atlantic.

6. "Besides, there is the English Channel, which really joins the Atlantic and the North Sea. This is a very wide channel, and it stretches

all along the south coast of England. And Dad says that sailors call the beginning of it, near Cornwall, the 'chops of the Channel'."

7. "Oh, Harry, here is a strait!"

"Where, Madge? Yes, that is the Strait of Gibraltar, between Spain and Africa. See what a narrow piece it is. It joins the Atlantic Ocean and the Mediterranean Sea.

8. "Dad told me that Gibraltar is a high rock, which the British took from the Spaniards 200 years ago. He said it is the strongest fort in the world, and has a great many soldiers and cannons to defend it. A long time ago the French and the Spaniards tried for three years to capture it, but they could not."

9. "I can see other straits," said Madge, who was getting quite clever in the use of maps. "Here they are, Harry, between the Mediterranean and the Sea of Marmora. What a little sea, Harry!"

10. "Yes, I remember, Madge. Dad showed me them; they are called the Dardanelles. I think that was the word.

"But I want to show you what Dad showed me, so we must go back to the British Isles.

11. "If we go up by the western coast of Britain, we shall come to the Menai Straits. That is a narrow passage of the sea between the island of Anglesey and Wales.

12. "When we come among the islands on the

west of Scotland, we find lots of straits. They are between the islands, or between the islands and the mainland; and then we find that they are not called straits, but Sounds.

13. "There is Kilbrannan Sound, the Sound of Jura, Sleat Sound, and many others.

"Well, I think you will have to put these right in your maps too when you are a man. Call them all straits, Harry, every one!"

56. Continents and Oceans

1. "What do you think Dad says now, Madge? He says that all the world is like England, and the sea that is round it. All the world, he says, is either land or water, just as England is land and the sea around it is water.

2. "At first I could hardly believe that, but now I come to think of it, I can't see what else there could be; but I am afraid I looked as though I could not believe it. So Dad said, 'Well, now, Harry, take this map of the world, and see whether you can find anything besides land and water on it.'"

3. "Could you find nothing else, Harry? Can't there be mud?"

"Oh, but mud is only wet land, or land and water mixed."

"There could be iron or coal, couldn't there?"

and Madge looked so very wise that Harry had to think before he could reply.

4. "Oh no, Madge! I am sure iron and coal are part of the land too. At least, they are not water."

"But there is ice, and—and—rivers," said Madge, in a last effort to find out something.

"No, Madge, that will not do either, for ice is water, and rivers— Why, of course! They are water too.

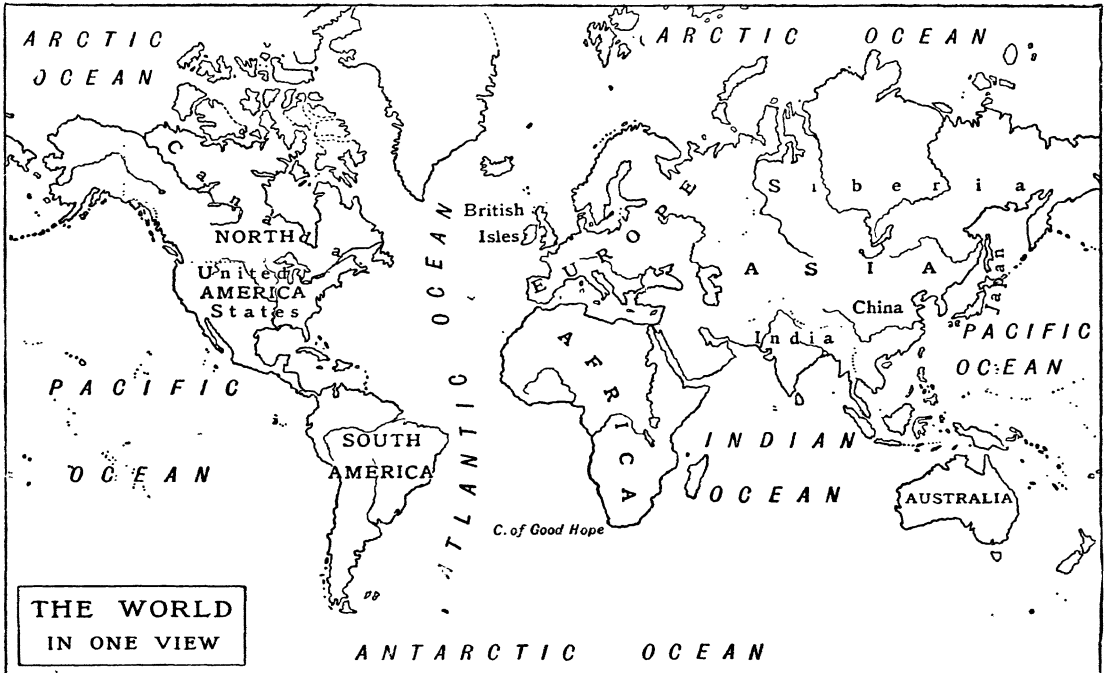
5. "But here is the map of the World, let us look at that." And Harry spread out a map of the world that showed the land and the water; the land was left white, and the water was all a pale blue.

6. "Oh, what a lot of water there is!" said Madge. "There seems to me to be more water than land."

"So there is more water than land; but do you see that most of the land is in the north part of the world, and most of the water is in the south part?"

7. Madge thought that she knew all that anyone need know about the world now; and so did Master Harry, till one day their father printed on a map the name Continents on big parts of the land, and the name Oceans on big parts of the water.

8. "There, Harry," said he; "now you can learn the names of the continents and the names of the oceans."


ARCTIC OCEAN
ARCTIC OCEAN
NORTH AMERICA
United States
British Isles
EUROPE
ASIA
Siberia
China
India
Japan
PACIFIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
AFRICA
INDIAN OCEAN
SOUTH AMERICA
AUSTRALIA
C. of Good Hope
ANTARCTIC OCEAN
THE WORLD
IN ONE VIEW

Harry thought the names looked rather big, but he soon learned how to pronounce them. Then he was in a hurry to show Madge how much more he knew than he did yesterday.

9. "I say, Madge, some parts of the land of the world have got names, and so have some parts of the water, and I can read them off the map. Now, see.

10. "This big piece of land is Europe; that is one continent. This big one to the eastward of that is Asia, and this big piece south of Europe is Africa. And then over here to the west are two great continents; one is North and the other is South America. There is another continent yet, and that is Australia."

11. Harry was quite out of breath with what Madge thought a most wonderful kind of lecture.

"What *is* a continent, Harry?"

"I told you, Madge. I said it was a big piece of the land of the world. Dad says it might have ever so many different countries in it."

12. "Oh, I know," said Madge; "something like our flower-garden, with ever so many different flower-beds in it."

"Yes, I suppose it is something like that. But you have not heard me go through the oceans yet, Madge, so just listen.

13. "Here is the Atlantic Ocean, and up in the north is the Arctic Ocean, and in the south

the Antarctic Ocean; and here's the Indian Ocean, and this is the Pacific Ocean."

14. "Thanks, Harry," said Madge. "Now, see if I can name the different continents and oceans." Then she repeated them as her brother had just done, and Harry cried out, "Well done, Madge!"

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57. The Continents—Europe

1. Europe is, with the exception of Australia, the smallest of the continents. But it is the most interesting of them all to us, because our own country forms a part of it.

2. If you look at a map of Europe, you will notice that parts of it are painted in different colours. These coloured parts of the map show us the countries of which Europe is made up.

3. Some of the countries are divided from their neighbours by high mountains, by rivers, or by parts of the sea. In other cases a line of posts, like milestones, marks where one country ends and another begins.

4. A great part of the surface of Europe is very flat. In Holland there are no mountains at all, and the much greater country of Russia is one huge plain, with only a little high land.

5. The Alps, in Switzerland, are the highest mountains. But there are other ranges, such as the Balkan Mountains in Turkey and the

Pyrenees in Spain, which are much higher than any of our English mountains.

6. The chief countries in Europe are the United Kingdom, Germany, France, Italy, Austria, and Russia. These are often called the Great Powers of Europe. There are besides a great many other countries, not so powerful as those we have named, but each having a government of its own.

7. Germany, Austria, and Russia are empires, and their rulers are called Emperors. Each of these empires consists of several states. In Germany each of these states has a ruler of its own. These rulers have various titles. But all the rulers look upon the German Emperor as their head.

8. France is a republic. The head of its government is a person selected by the people themselves. The person chosen is styled the President of the Republic, and he holds his office for seven years.

9. The British Isles—that is, Great Britain and Ireland—are among the smaller countries of Europe. Yet the United Kingdom, as it is called, is as powerful as the largest, for it owns lands in every part of the globe. The British Empire includes India, Canada, Australia, South Africa, and much land besides.

10. It is, in fact, the greatest empire the world has ever seen. British ships sail over every

sea, carrying the cotton, woollen, and iron goods made in the busy towns of England and Scotland, to be exchanged for the produce of distant lands. No country in the world has so many trading vessels nor so many war-ships.

11. These are needed to protect British trade and the British possessions scattered over the world. So powerful is the Royal Navy, that Britain is often called the "Mistress of the Seas".

A Turk

12. All the European nations are Christians except the Turks. The Turks believe in Mahomet. Followers of Mahomet are called Mohammedans, and instead of the Bible they believe in the Koran, a book written by Mahomet. The Turks came from Asia several hundred years ago. Their ruler is called the Sultan.

13. The countries in the south of Europe are warmer than those in the north. The people in them are not so industrious and energetic. Spain and Greece, which once were Great Powers, are now of little importance.

58. The Continents—Asia

1. To the east of Europe is Asia, the largest of all the continents. It contains about one-third of the land of the globe. Few people live in the far north of Asia, because it is so very cold.

2. In the south and east the climate is different. There it is very hot. The land, too, is fertile, and the population large. Indeed Asia holds nearly half the people in the world.

Large animals, like the elephant and the tiger, live in the sunny south, and parrots and monkeys are very numerous.

3. The highest mountains in the world are in Asia. These are mainly in the centre. Several great ranges start from a central plateau, in the same way as the spokes of a wheel stick out from the hub. This is the lofty plateau of the Pamir, often called the "Roof of the World".

4. One of the most important countries is India. It is more than a dozen times as large as the British Isles, and contains over three hundred million people. There are several different races of people in India, but the Hindoos are the most numerous.

5. The natives till the soil with great care, although they work with tools such as their forefathers used a thousand years ago. Cotton is very largely grown, and wheat is produced even

MAP OF
ASIA.
English Miles
0 400 800 1200
EUROPE
Siberia
West Siberia
TURKESTAN
MONGOLIA
MANCHURIA
CHINESE EMPIRE
CHINA
TIBET
INDIA
PERSIA
ARABIA
AFRICA
ARABIAN SEA
BAY OF BENGAL
PACIFIC OCEAN
NORTH
BEHRING SEA
KAMTSCHATKA PENINSULA
SEA OF OKHOTSK
SEA OF JAPAN
YELLOW SEA
JAPAN ISLANDS
KURILE IS.
YESSO
FORMOSA
PHILIPPINE ISLANDS
SIAM
CEYLON
Aral Sea
L. Baikal
L. Baikash
Hindoo Koosh
Himalaya Mts.
Thian-shan Mts.
Kuen Lun Mts.
Altai Mts.
Yablonnoi Mts.
R. Amoor
R. Lena
R. Obey
R. Yenisei
R. Indus
R. Ganges
R. Brahmapootra
R. Irawaddy
R. Menam
R. Cambodia
Hoang Ho or Yellow R.
Yang-tse-Kiang R.
Cape Comorin
Maldive Is.
Laccadive Archo.
Andaman Is.
Nicobar Is.
Mt. Everest
Hong Kong
Chusan
Hainan
Luzon
Mindanao
Borneo
Celebes
Sumatra
Java
Str. of Sunda
Str. of Malacca
Str. of Bab el Mandel
Gulf of Aden
Gulf of Oman
Gulf of Cutch
Gulf of Cambay
Gulf of Marmora
Black Sea
Caspian Sea
Red Sea
Isthmus of Suez
Cyprus
Rhodes
Taurus
Mt. Ararat
Euphrates R.
Tigris R.
Persian Gulf
Kara Sea
New Siberia
C. Chelyuskin
C. East
Gulf Anadir
C. Lopatka
Kurile Is.
Yesso
Japan Islands
Sea of Japan
Yellow Sea
Formosa
Hong Kong
Hainan
Luzon
Philippine Islands
China Sea
Siam
Cambodia Pt.
Pr. Indo-China
Mindanao
Borneo
Celebes
Sumatra
Java
Str. of Sunda
Str. of Malacca
EAST INDIA ISLANDS.
English 0 400 800 1200 Miles

cheaper than it is in America. Much of the tea that is used in this country comes from India.

6. China is another important country in Asia. It contains vast numbers of people. Many of them live in boats on the large rivers, and seldom come on land.

7. The Chinese are a strange-looking race, with their yellow skins, slanting eyes, and long pigtails. The men amuse themselves with kites and marbles, as boys do with us. They are a very industrious people, but crafty, cruel, and treacherous.

8. The Chinese do not like to admit foreigners into their country. Though they are really much behind European nations in many ways, they consider themselves superior. They have many large cities, but the streets are very narrow and extremely dirty. Their shops, like the native shops in India, have no windows, and they are generally small.

9. China has long been famous for silk and tea; and it is said that gunpowder and the mariner's compass were used there long before they were known in Europe.

10. The Japanese are like the Chinese in appearance, but they do not wear pigtails. They are more advanced than the Chinese, and are eager to improve. Their country is not nearly as large as China, nor are there so many people; but Japan is at present more powerful, because

it has adopted the more civilized methods of the Western nations.

11. The Malays are a brown-skinned race. Their home is in the Malay Peninsula and the islands near. They are generally clever sailors,

Asiatic Natives. 1, 2, Chinese; 3, 4, Japanese; 5, 6, Malays

and at one time were famous pirates. But British gun-boats have done much to check their habits of plunder.

12. Siberia, in the north, belongs to Russia. The various tribes of natives wander from place to place, living in tents and supporting themselves by hunting and fishing, or by their flocks of sheep.

59. The Continents—Africa

1. Africa lies to the south of Europe. It has several great rivers, such as the Nile, Niger, and Congo. Its few ranges of mountains are chiefly near the coast, and great stretches of land in the interior are desert.

2. Its climate is hot, much hotter than that of Europe. The west coast is very unhealthy for white men. Yet, in spite of the dangerous fevers that rob them of their strength, many traders visit this coast to procure from the natives palm-oil, gold-dust, ivory, and rubber.

3. Africa is often called the Dark Continent, because so much of it is yet unknown. Also, most of its people are negroes, and many of them are ignorant savages, whose life may well be called dark when compared with that of Europeans.

4. The parts of Africa that lie nearest to Europe are not inhabited by blacks. There are various races, but Egyptians and Arabs are most numerous. The Arabs are a wandering people, who are not fond of cities and houses, but prefer the open country.

5. They live in tents, and move about in the deserts from one oasis to another, with their camels, horses, sheep, and goats. Some of them

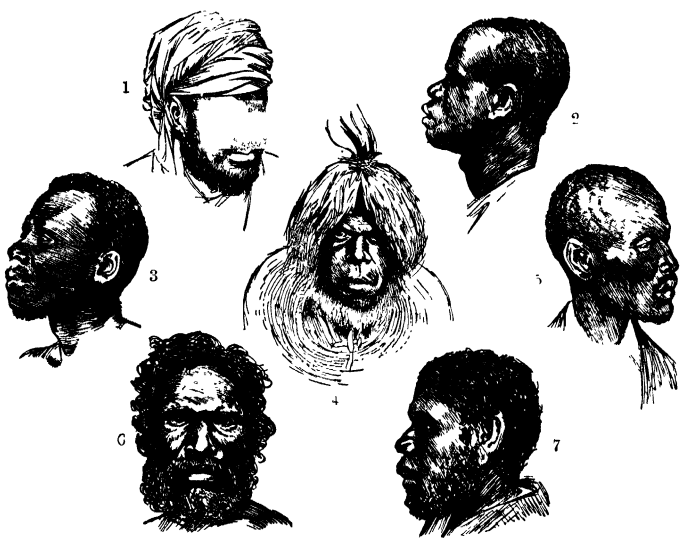
are engaged in trading with the negroes of the Soudan for gold, ivory, and slaves.

6. The Soudan lies south of the Sahara, and

stretches across Africa almost from east to west. The inhabitants of this part of Africa are mostly negroes. Indeed, the name "Soudan" means the land of the blacks.

7. The part of the Soudan south of Egypt is called the Anglo-Egyptian Soudan, and is ruled by British officials. Farther to the west, the Soudan has been divided among Britain, France, and Germany.

8. South of the Soudan, large portions of land



African Natives: 1, 2, Soudanese; 3, Nubian; 4, 5, Bantus 6, 7, Australian Natives

have been taken possession of by England, France, and Germany. In some parts, such as Uganda in the east, railways are being made to open up the country for trade. In time, no doubt, Central Africa will be fully known, and its savages will be instructed in European ways and customs.

9. The greater part of South Africa is in the hands of the British. At one time a portion called Cape Colony belonged to the Dutch, but they ceded it to Britain about one hundred years ago.

10. Since that time the British have taken more and more of South Africa. It is thought that in a few years the British will hold parts of Africa stretching from the north to south. Then the present railways will be added to, and we may hope to see one about 5000 miles long, running from the Cape of Good Hope to Cairo in Egypt.

11. British settlers in South Africa are chiefly engaged in trade, mining, and farming. Sheep are reared for their wool, ostriches for their fine feathers, and large quantities of fruit are sent from the Cape to England.

12. The gold and diamond mines employ many workers, both natives and men who have come from all parts of Europe. The white men, most of whom are from England and Scotland and various parts of the British dominions, are chiefly engaged in directing and superintending the native workmen.

13. Wild animals in great numbers are found in Africa. Hunters from many countries travel into the interior to shoot elephants, lions, giraffes, antelopes, and other big game.

60. The Continents—Australia

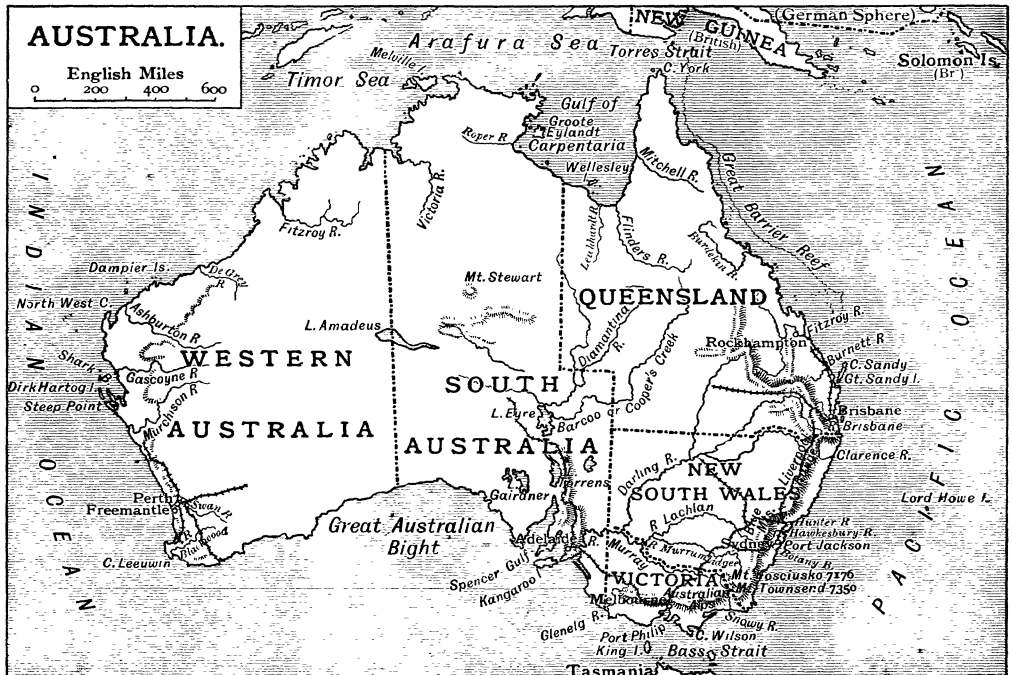
1. The smallest continent is Australia. It is only a little more than a hundred years ago since English people first settled there. At that time it was inhabited by a few tribes of black people, but the natives are gradually dying out.

2. If we look at the map, we shall notice that there are low mountain ranges lying near the coast, and only a few in the interior. There are few rivers also in Australia, and only one—the Murray—that is of much use as a waterway. Most of the rivers are merely shallow streams, which dry up in summer, and flood the land in the rainy season.

3. The plants and trees of Australia are unlike ours. The leaves of most of them are green all the year round. On some kinds of trees the leaves do not turn brown and fall off in autumn, as we should expect. Instead of doing so, the *bark* splits and falls from the trunk when the cold weather begins.

4. The blue gums, which grow along the sides of some of the streams, are among the tallest trees in the world.

The animals and birds, too, would seem strange to us. The largest animal is the kangaroo. The hind-legs of this creature are much longer than


AUSTRALIA.
English Miles
0 200 400 600
Arafura Sea
Timor Sea
Torres Strait
NEW GUINEA
(British)
(German Sphere)
Solomon Is.
(Br.)
C. York
Melville I.
Gulf of Groote Eylandt
Carpentaria
Roper R.
Wellesley Is.
Mitchell R.
Great Barrier Reef
Victoria R.
Fitzroy R.
Limmen Bight R.
Flinders R.
Leichhardt R.
Burdekin R.
Mt. Stewart
QUEENSLAND
Dampier Is.
De Grey R.
North West C.
Ashburton R.
L. Amadeus
Fitzroy R.
Rockhampton
Burnett R.
C. Sandy
Gt. Sandy I.
Shark B.
Gascoyne R.
WESTERN
AUSTRALIA
SOUTH
AUSTRALIA
Diamantina R.
Cooper's Creek
Dirk Hartog I.
Steep Point
Murchison R.
L. Eyre
Barcoo or Cooper's Creek
Brisbane
Clarence R.
Darling R.
NEW SOUTH WALES
Lord Howe I.
Perth
Fremantle
Swan R.
Gairdner L.
Darling Ra.
Lachlan R.
Hunter R.
Hawkesbury R.
Sydney
Port Jackson
Botany B.
Great Australian Bight
Adelaide
Murray R.
Murrumbidgee R.
C. Leeuwin
Mt. Kosciusko 7176
Mt. Townsend 7350
Spencer Gulf
Kangaroo I.
Melbourne
Australian Alps
Glenelg R.
Port Phillip
Sydney R.
C. Wilson
King I.
Bass's Strait
Tasmania
INDIAN OCEAN
PACIFIC OCEAN

its fore-legs, so that it is unable to run, but moves along with great jumps.

5. The largest of Australian birds is the emu, but it cannot fly. Its body is large, its wings are small, its legs are long, and it can run very swiftly. Parrots, with their beautiful, many-coloured plumage, are very numerous.

6. There are many other birds, beautiful to look at; but they cannot sing as our larks and thrushes do. One bird, a little larger than a pigeon, has been given the strange name of the "laughing jackass" because of the strange noise it makes.

7. In wet weather the broad plains of Australia are covered with short, rich grass. This makes splendid food for sheep and cattle.

A single owner will sometimes have a quarter of a million sheep of his own. In this country we think a farm is a large one if it is a square mile in size, but in Australia some of the sheep farms, or "runs", are more than a hundred times larger than this.

8. Australia is the great wool-producing continent. Ships bring us every year enormous quantities of wool to be made up into cloth in the great towns of Yorkshire. They bring us also frozen meat, gold, corn, fruit, and timber.

9. About fifty years ago gold was discovered in Australia, and at once many people went there to dig for it. Some of them were lucky

enough to find it, and made their fortunes; but very many were disappointed, and returned as poor as they went.

10. Many, however, remained in Australia when the "gold rush" was over. Some settled in cities

A "Baby" Kangaroo

like Melbourne and Sydney, which soon became equal in size and importance to the great cities of Europe.

11. Others went inland, and started farming on land which they bought from the Government at a very cheap rate. Many of these have found that sheep and cattle farming is a surer way of making a fortune than gold-digging.

61. The Continents—North America

1. America is often spoken of as the New World. That is because it has only been known to the people of the Old World for about four hundred years. It consists of two great parts, North and South America, which are joined together by a narrow strip of land, the Isthmus of Panama.

2. A highland system, widest in the middle and narrowing both towards the north and towards the south, runs down the west side of North America. This is known as the Rocky Mountains, and it gives rise to many great rivers.

3. North America is separated from Europe by the Atlantic Ocean, but the two continents are connected by telegraph cables under the sea. Many swift steamers cross the ocean every week, so that we do not seem to be very far apart.

4. The northern portion of North America is called the Dominion of Canada. The far north of it is very cold—too cold for English people to live there in comfort.

The native Indians are chiefly engaged in hunting and trapping wild animals for the sake of their skins and furs.

5. Farther south the weather is milder.

ARCTIC OCEAN
GREENLAND
Iceland
Baffin Bay
Davis Str.
BAFFIN LAND
R. Yukon
ALASKA (U.S.)
Mackenzie R.
Hudson Str.
HUDSON BAY
BRITISH NORTH AMERICA
ROCKY MTS.
CANADA
Newfoundland
St. Lawrence R.
Vancouver
New Westminster
Calgary
Regina
Winnipeg
L. Winnipeg
Saskatchewan R.
Quebec
MONTREAL
Ottawa
Halifax
L. Superior
L. Huron
Boston
L. Michigan
Chicago
L. Ontario
Toronto
L. Erie
NEW YORK
Philadelphia
WASHINGTON
San Francisco
UNITED STATES
St Louis
Mississippi R.
Charleston
New Orleans
GULF OF MEXICO
Havana
Cuba
Haiti
Jamaica
CARIBBEAN SEA
MEXICO
CENTRAL AMERICA
SOUTH AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
ASIA
Bering Str.
R. Yukon
ALASKA (U.S.)
NORTH AMERICA

Great forests cover part of the land. In winter the trees are cut down. In spring they are tumbled into the streams, and floated down to the nearest saw-mills, to be cut up into logs and planks. Vast quantities of timber are sent to us every year from Canada, and, besides timber, large quantities of cheese, wheat, and flour.

6. The United States, the great country in the middle portion of North America, also send us corn, as well as meat and cheese. The people of the United States are mostly of British descent. They speak the same language, and in most other ways closely resemble the people of Great Britain.

7. The United States is nearly as large as the whole of Europe. On the east of the Rocky Mountains there is a vast treeless region with scanty rainfall, the Great Plains, which is fit only for grazing, but the larger part of the country is very fertile.

8. Its farms are among the largest and finest in the world. Sheep, cattle, and horses are reared on the western prairies in huge numbers. It is rich, too, in minerals. There are gold and silver mines in California, while coal and iron are found in the east.

9. Oil, too, is found, and many oil wells have been sunk. A great deal of the oil burnt in English lamps comes from the United States.

10. In so large a country there are bound to be great differences in the seasons. In some parts the winters are long and cold, and the summers shorter than in England but much hotter. In others snow is scarcely ever seen, and the hot summer is the longest season of the year.

11. In the west, especially on the Great Plains, there are often fierce storms called "blizzards". Travellers are unable to stand against the bitter cold and the drifting clouds of fine snow.

12. In the east and south of the United States, large quantities of cotton, sugar, and tobacco are grown. Fruit-growing is carried on largely, both in the eastern and western states. Many of the machines that make work easy, and produce articles quickly, have been made by the Americans, who are an active and inventive race of people.

13. The United States is also a great manufacturing country.

14. The chief city in the United States is New York, which, as a busy seaport, is second only to London itself.

PART OF THE RIVER FRONT. NEW YORK

62. The Continents—South America

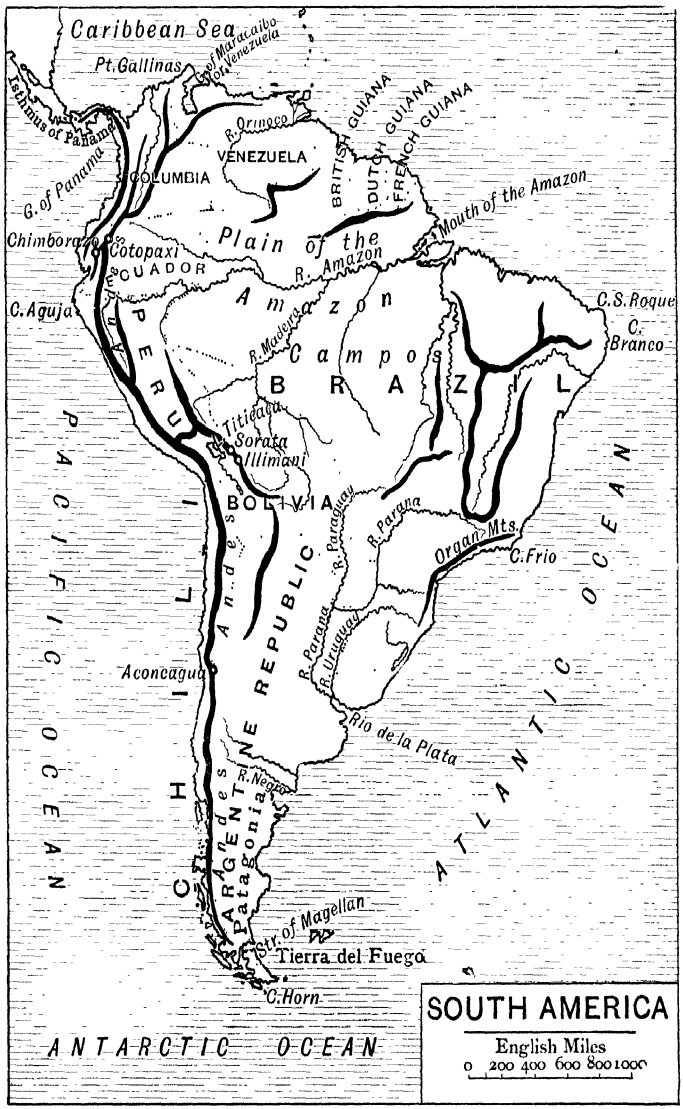
1. South America is in shape somewhat like Africa. It is better off, however, than that continent for mountains and rivers. The great chain of the Andes, which runs along its western coast for about 4000 miles, is one of the finest in the world.

2. Many of its mountains are volcanoes of great height. Cotopaxi, the most famous volcano, is about 20,000 feet high; but the highest mountain is Aconcagua, which overtops the volcano by more than three thousand feet.

3. Most parts of the Andes feel, from time to time, the shocks of earthquakes. The city of Lima, so it is said, has had to be rebuilt no fewer than six times.

4. Besides the Amazon there are other great rivers, the chief of which are the Orinoco and the Parana. There are but few lakes, and some of these are salt. Titicaca, among the Andes, is the largest, covering a space about the size of Devon and Cornwall.

5. It is to South America that we owe the potato. The Spaniards brought it to Europe four hundred years ago; but it was nearly a hundred years afterwards that potatoes were


Caribbean Sea
Pt. Gallinas
G. of Maracaibo
Lake Venezuela
Isthmus of Panama
G. of Panama
R. Orinoco
VENEZUELA
COLUMBIA
BRITISH GUIANA
DUTCH GUIANA
FRENCH GUIANA
Mouth of the Amazon
Chimborazo
Cotopaxi
ECUADOR
Plain of the R. Amazon
C. Aguja
PERU
Amazon
Campos
BRAZIL
C. S. Roque
C. Branco
R. Madeira
Titicaca
Sorata
Illimani
BOLIVIA
R. Paraguay
R. Parana
Organ Mts.
C. Frio
Andes
CHILI
REPUBLIC
R. Parana
R. Uruguay
Aconcagua
Rio de la Plata
R. Negro
ARGENTINE
Patagonia
Andes
Str. of Magellan
Tierra del Fuego
C. Horn
PACIFIC OCEAN
ATLANTIC OCEAN
ANTARCTIC OCEAN
SOUTH AMERICA
English Miles
0 200 400 600 800 1000

first brought to England by Sir Walter Raleigh, in the days of Queen Elizabeth.

6. From the same continent we get cocoa, arrowroot, and tapioca. The two latter are both made from the cassava plant. The juice of this plant is poisonous, and the Indians used it to poison the tips of their arrows; hence the name "arrowroot".

7. Among other useful things obtained from South American trees and plants are quinine, india-rubber, tobacco, and cayenne pepper. Quinine is got from the bark of the cinchona-tree, which grows chiefly on the slopes of the Andes.

8. Brazil is the largest country in South America. It once belonged to Portugal, and its people are mainly descendants of the Portuguese. Still, in the wilder parts of the country, there yet remain tribes of the native Indians.

9. Diamonds are found in Brazil, but the country gains more profit from the growing of coffee and sugar-cane than from diamond mining.

10. On the pampas of Uruguay and of the Argentine Republic great herds of sheep, cattle, and horses are reared. The sheep and cattle are largely exported to England, and these countries do also a large trade in preserved meat, in dairy produce, and in wool and hides.

11. The gold and silver mines of the Andes have been famous for hundreds of years. They

attracted the Spaniards in the sixteenth century to conquer Peru, Bolivia, and other parts in the north and west. The silver mines of Potosi, in Bolivia, are the best known, but there are others just as valuable in Peru.

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63. The Oceans—The Atlantic

1. The Atlantic Ocean, although not the largest, is the most important of the oceans. It lies, as may be seen by looking at the map, between the western shores of Europe and Africa, and the eastern shores of America.

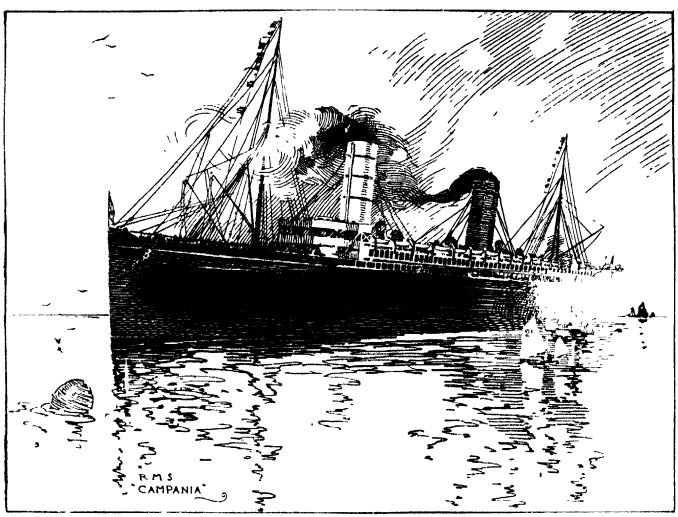
2. Its length is greater than its breadth. In the far north and south its waters are cold, and great mountains of ice, called icebergs, are often floated from these cold regions to the warmer parts of the ocean that lie nearer the Equator.

3. In the middle portion of the Atlantic there is a current of warm water, which flows through the ocean just as a river flows through the land. It is called the Gulf Stream.

4. This is not the only current in the Atlantic, but it is the best known. It makes its way from the Gulf of Mexico towards the British Isles. Before reaching England, however, the Gulf Stream breaks up, and its waters mingle with the ocean, and give their warmth to the seas on the west of the British Isles.

5. The greatest distance across the Atlantic is about four thousand miles, and the least is about a half of that. Yet the ocean is often crossed in a week by steamers, which steam day and night without stopping.

6. Some of the swiftest steamers take about



An Atlantic "Greyhound"

five days to cross. These are often called the greyhounds of the Atlantic. They are huge vessels about 200 yards long, and carry hundreds of passengers.

7. The Atlantic is the great ocean of trade. More ships cross its waters than cross any other ocean. Most of them are British, and

are engaged in carrying British goods and passengers to Canada and the United States, and in bringing back to Britain the produce of these countries.

8. Great Britain does a large trade with all parts of America, especially with Canada, the United States, and the Argentine Republic. From the New World, Britain imports in particular food-stuffs, such as corn and flour, butter, sugar, cheese, and meat. She imports also raw cotton, wool, and hides for her manufactures.

9. The waters of the Atlantic abound in fish, and off the coasts of the British Isles and Newfoundland many fishing-boats are engaged in catching herrings, mackerel, and codfish. In the far north whales are found, and men go out in ships to capture them for the sake of the oil and whalebone which are obtained from them.

10. A great deal has been learnt about the bottom of the Atlantic. Ships have gone out to different parts of the ocean, carrying with them, amongst other things, a kind of hollow iron-rod, fastened to the end of a long line. This has then been sunk, and the depth of the water found by measuring the length of the line.

11. The iron rod, too, when pulled up again, has brought with it a little of the mud from the bottom of the ocean. Using this rod and line is called sounding the ocean, and from it we learn,

among other things, that the bed of the sea is no more level than is the surface of the land.

12. Broad plains, deep valleys, and high mountains lie under the water. When the mountains are so high that they reach above the surface of the water, they form islands.

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64. The Oceans—The Pacific and Indian Oceans

1. The Pacific is the largest of the oceans. It is more than ten thousand miles in length and breadth, and contains nearly half the water on the surface of the earth. It is greater in size than the whole of the land on the globe.

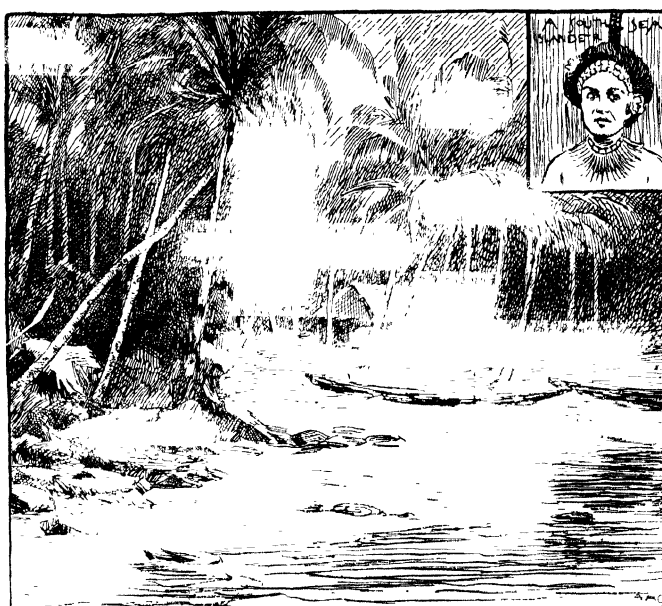
2. The Pacific lies between the western shores of America and the eastern shores of Asia and Australia. The ocean was given its name, about the year 1521 A.D., by a Portuguese seaman named Magellan.

3. He had been sailing for a long time in the stormy waters of the Atlantic, near Cape Horn, and his ships had been badly treated by the rough waves. To avoid the storms, he entered a narrow opening which he espied in the land, and sailed through it.

4. At last he found that the passage along which he was sailing was a strait, which led into the quiet waters of this almost unknown ocean.

The change was so welcome to him and his sailors, that he named the ocean the Pacific, or the Peaceful Ocean.

5. It was a long time, however, before sailors felt comfortable in sailing on the Pacific. They



On the Shore of a South-Sea Island.

had to travel enormous distances without sight of land. Even when they came to islands, they were uncertain how they would be received. The natives in many of the islands were not friendly, and whenever they were able they put to death the crews that ventured ashore.

6. There are many islands in the Pacific. Some of them lie off the shores of the continents, while others occur in mid-ocean, far away from any other land. On many of them, so many sweet-smelling trees and shrubs grow, that the air is laden with perfume, which can be smelt by the sailors far out at sea.

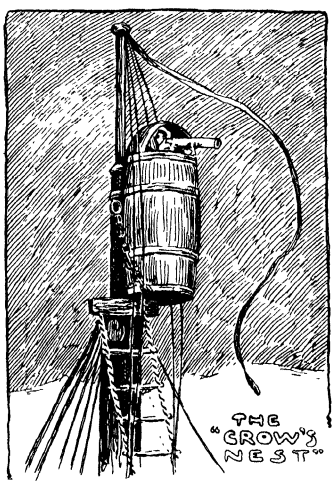
7. The people who live on the coral islands, about which we have already read, have queer little boats, not shaped like ours, in which they sail on the sea. But they seldom venture far from land.

8. The warm waters of the Pacific abound in sharks, and bathing is therefore very dangerous. These creatures will often swim alongside a ship for days together, on the look-out for any food that may be thrown overboard.

9. The Indian Ocean lies to the south of Asia. It is the warmest of all the oceans. But there are many rocks and coral reefs in it, which make it rather unsafe for ships. At times, too, very violent and sudden storms sweep over its surface.

10. Like the Atlantic, the Indian Ocean is a great highway of trade. Every year it is crossed and re-crossed by the numerous ships engaged in the trade between Great Britain and India and Australia, and between Europe and the Far East.

65. The Oceans—The Arctic and Antarctic Oceans



1. The Arctic Ocean is in the far north of the world. It has never been fully explored, for great parts of it remain covered all the year round with ice, piled mountains high. The only ships that visit it are whaling vessels and the ships of explorers.

2. During the short, hot summer that lasts for about three months, the ice along the outer edge of this ocean breaks up into large masses. Many of these are carried along by currents southwards to melt in the warmer waters of the Atlantic.

3. These great icebergs are grand sights. Sometimes their shapes are such that you might fancy they were great castles or churches built on rocks of ice. They often stand one or two hundred feet above the surface of the water, but the part below the surface is about eight times as big as that which is visible.

4. Arctic explorers choose for their voyages the time when the ice breaks up. Passages of water like lanes or streets are then open to them. Through these they carefully make their way, keeping a man perched in a kind of tub at the top of the mast to guide them. The tub is called a "crow's-nest".

5. An exploring ship is built for strength rather than for speed. Its sides are lined with thick planks, and there are strong beams within the hull, crossing from side to side.

6. A vessel of this kind can stand a squeeze from floating masses of ice which would crush an ordinary ship as easily as you could an egg-shell. Besides, a ship has sometimes to make its way through the ice by charging at it, like a ram.

7. Explorers carry with them food for many months. They do not always return at the end of summer, but build huts on the ice and remain during the winter. Their chief trouble then is to keep warm, even when sitting by a stove.

8. An Arctic winter must be terrible. Not only is the cold greater that we can imagine, but there is no real daylight for several months. Fancy a night that lasts for months! It is true that it is not quite dark, and often the sky glows with what are called "The Northern Lights".

9. Great white bears, called polar bears, are the only animals to be met with in the Arctic Ocean in winter. They are the strongest and

largest of bears. Seals may be seen in the summer-time, and the great walrus or sea-horse.

10. As in winter there is a long night, so in summer there is a long day. This lasts really for many days. During this time the sun never sets, but goes round and round the sky.

11. The Antarctic Ocean is in the far south of the world. In other respects, it is the same as the Arctic Ocean, except that it has not been visited so much by explorers.

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66. Seas

1. "I should think I need not be asked what an ocean is in that particular way, Harry? If I did make a mistake about a continent, what then? If a continent is a big piece of land with a good many countries in it, I should think an ocean is a big piece of water with a good many seas in it!"

2. Harry opened his eyes this time, he seemed so astonished.

"Well, I cannot make that out, Madge. It sounds all right, and I think there must be a good many seas in a big ocean, like the Atlantic Ocean, for instance."

"There would be a good many Mediterranean Seas in it, would there not?"

3. "Yes, but they would all be mixed up together, Madge. Anyhow, Dad says the oceans are very big, and that they are deeper in some parts than the highest mountains in the world are high. Fancy an ocean more than five miles deep!"

4. "Oh don't, Harry! I shall be afraid to go on the sea."

"Still, Madge, I believe you are nearly right, for the seas are parts of the oceans almost always; and they might just as well say that an ocean is a great piece of water with a good many seas in it. Or at least I think so.

5. "Now, let us look at the Atlantic Ocean. That has many seas connected with it, anyway. Look, here is the North Sea, and there is the Baltic Sea, and the Irish Sea is between England and Ireland.

6. "Then, to the south of Europe, I see the Mediterranean Sea, the Adriatic Sea, the Black Sea, and the Sea of Azof, and these are all connected with the Atlantic Ocean.

7. "These are all on the east side of the Atlantic Ocean. There are other seas on the west side. There is the Caribbean Sea, between the West Indies and South America. Then there is the Sargasso Sea, north-east of the West Indies. Dad says that is a big piece of the ocean covered with sea-weed, but it is not always marked on maps."

8. "Are there any seas in the Pacific Ocean, Harry?"

"Oh, there must be, Madge. See, here are the Yellow Sea and the China Sea, both near to China. Now, Madge, look at the Indian Ocean and find some for yourself."

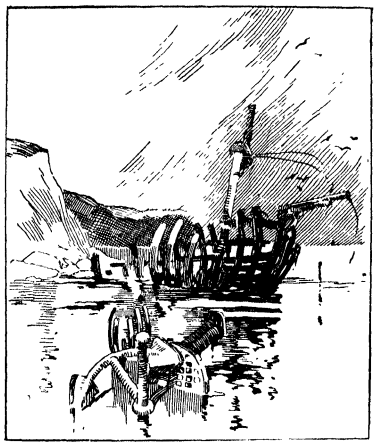
"I can only see two, Harry, and they are the Arabian Sea and the Red Sea.

9. "Then a sea is smaller than an ocean, isn't it, Harry?" said Madge.

"Why, of course it is. A sea could not be divided into oceans, but an ocean can be, and really is divided to some extent into seas."

10. "Really, Harry, I believe that some day you will write books. Your last speech sounded just like one."

67. The Use of the Sea to Man



1. "I think the sea is a great deal more use than the land," said a broken and battered old ship that was sticking up out of the sand like rows of bandy-legged posts.

"Really!" said Madge. "I should not have thought that."

2. "Not have thought it?" said the ship. "Why, look at me! I am stuck fast here on the land! If that horrid November storm had not driven me off the sea on to the land, I should have been going about the world as useful as ever."

3. "So you would," said Madge. "But we can walk on the land; and the land grows us cabbages and corn, apples and pears, and lots of other things."

4. "Pooh!" said the old ship; "you wouldn't have half enough to eat if it were not for the sea. The sea is a great highway all over the world, and if it were not such a good old sea you would

be badly off with your cabbages and corn, apples and pears."

5. "Oh, but the land grows lots of other things!" said poor Madge.

"Not in this part of the world, at least not to speak of, my dear," said the tender-hearted old vessel, who thought Madge was going to cry.

6. "Why, if the old ocean did not take the ships all over the world, you would have no tea, or sugar, or coffee, or cocoa—no chocolate-creams, think of that!—and no tobacco, and no rice, no raisins, no currants, no spices.

7. "No oranges, no cocoa-nuts, no figs, no dates; and talk about corn, why, you would not have enough for half a year. And you would have no cotton to sew on buttons with, nor even a doll worth looking at, and—"

8. "Oh, please, Mr. Ship, don't go on! I shall cry out loud if you do. But all those things do not come over the seas, do they?"

9. "Yes, of course they do," said the ship. "Ah me! I really should weep if I were not so dry in this hot, hot sand. I have fetched all those things and a good many others in my time from Europe and Asia, and Africa, and America, and Australasia, and from everywhere else.

10. "Oh, it was delightful to have the jolly sailors climbing about my rigging and setting my sails, and steering me for thousands and thousands of miles—and now, look at me!"

"Poor old ship!" said Madge, as big tears rolled down her cheeks. "What a very sad change for you!"

11. "Change! Ah me, you are right, my little missie. But it is not change, it is the want of change that has broken my heart. I have been here two years without stirring from this spot. I cannot bear the land; I cannot see the use of it at all!"

12. "Dear me!" said Madge, very thoughtfully. "I like the land best — but perhaps I don't know. After all, isn't it the land that grows all the things you have mentioned in other parts of the world?"

13. "There you are!" said the ship; "no one ever agrees with me!" and his timbers shook so that Madge thought he was in a passion; but it was only Harry who jumped on to the wreck and woke her up.

"Why, you have been asleep, Madge!"

"Oh, so I must have been!" she said, as she rubbed her half-open eyes; "and I must have been dreaming, too!"

NOTES AND MEANINGS

Lesson

1. **dense**, thick, close. Used to mean also dull in mind or stupid.
2. **nettled**, irritated, in a temper.
   cardinal, chief, principal.
   lecture, a speech made for the purpose of giving instruction.
3. **argument**, discussion, dispute.
4. **absurd**, without sense, stupid.
   in a chorus, all singing together.
5. **magnetized**, made into a magnet.
   mariner, a sailor.
6. **adjusting**, arranging properly.
   conceited, having too high an opinion of one's self.
   ridiculous, laughable, silly.
   offensive, unpleasant.
   rebuke, reproach, scolding.
7. **imaginary**, not real, fanciful.
   represents, stands in the place of.
8. **geography**, a description of the earth.
12. **suitable**, fitting.
    similar, like, resembling.
13. **impudent**, rude, shameless.
    embrace, taking in one's arms, pressing to one's breast.
15. **occasionally**, now and then.
    concluded, resolved.
    gradually, little by little.

Lesson

16. **looking curiously**, with an inquiring look, looking carefully and closely.
    to make scientific observations, to look at things closely in order to get a complete knowledge of them.
17. **impassable**, cannot be passed.
19. **fertile**, fruitful, able to produce rich crops.
20. **mentioned**, named, spoken of.
    decayed rocks, rocks that are breaking up, that crumble to pieces readily.
    hindrance to navigation, ships or boats find it difficult to sail round these sand-banks on their way up and down the river.
21. **on the alert**, on the watch, ready.
    difficulties are overcome, boats and barges are enabled to get up the river above the shallows.
22. **filtered**, passed through any substance (paper, gravel, sand, charcoal, &c.) to remove or keep back any solid matter.
    reservoir, a place where water is collected and stored for use.
23. **missionary**, a man sent to preach the Gospel to the heathen.

Lesson

25. **trebled**, made three times as much.

enlighten, to make clear to the mind.

26. **stunted**, below the proper size, dwarfed, hindered from growing.

perpetual, everlasting, that never melts.

27. **incline**, slope.

not easily matched, it would be difficult to find another valley of the same kind as fine.

the sound, &c., strikes your ear, you hear the noise made by the falling water.

29. **formed naturally**, made by nature, *i.e.* without the aid of man.

make these ascents, climb the mountains.

30. **luxury**, anything delightful, a great pleasure.

31. **visible**, able to be seen.

bracing, strengthening.

intense, very great, extreme.

32. **in a state of eruption**, to be throwing out steam, ashes, or lava.

extinct volcanoes, those which have entirely ceased to send forth steam or lava or ashes.

33. **rumbling**, a low heavy sound like dull thunder or the noise made by rolling wagons at a distance.

site, the place where anything, such as a city or a house, is built.

34. **quiver**, a shaking or trembling.

yawning gulf, a deep gap in the earth with a wide opening.

clustered, crowded together.

Lesson

35. **volcanic districts**, tracts of land containing volcanoes.

36. **sedate**, quiet, serious.

38. **foliage**, leaves of trees, &c., leafage.

39. **dyke**, a mound or wall built to protect the land from river or sea floods, an embankment.

40. **driving storms**, violent storms.

41. **barren**, not producing anything, without trees, plants, &c.

desolate, lonely, without inhabitants.

shunned, avoided, kept clear of.

bleaching bones, bones that are turning white from exposure to the sun and the air.

42. **Michaelmas**, St. Michael's-day, Sept. 29th.

polka, a kind of round dance.

43. **most experienced jackdaw**, a jackdaw that had seen and done more than any other jackdaw of that time.

its great glories, that which it is most proud of.

a manufacturing place, a town where raw material, such as cotton, wool, iron, &c., has labour bestowed upon it to turn it into a form that may be more useful to man; a place where people make things.

energetic, pushing and hard-working.

quite wooden, thoroughly dull and stupid. Notice play on word *wooden*, which means made of wood.

48. **peculiar**, strange.

51. **Cape Horn, the extreme point**, the point or cape which stretches farthest to the south.

Lesson

52. **indentation**, an inward curve, a notch.

58. **battered**, kept on beating, struck heavy blows.

59. **empire**, a state consisting of several countries.

emperor, the ruler of an empire.

republic, a country where the rulers are chosen by the people and only keep their power for a time.

60. **old fashioned**, shaped like those in use many years ago.

foreigner, a native of another country.

advanced, improved.

62. **are dying out**, are getting fewer in number.

63. **minerals**, substances without life found in the earth.

inventive, quick at finding out fresh ways of working or making machines.

65. **greyhound**, a dog whose long limbs and slender body enable it to run very swiftly.

ocean of trade, the ocean on which most trading-vessels may be found.

66. **leaking**, letting in water.

67. **explorers**, those who travel in order to discover new lands or seas and to examine them thoroughly.

69. **bandy-legged**, having crooked legs.

riggings, the cords that support the masts and sails of a ship.

70. **bulges**, swells out.

71. **hemisphere**, half a sphere or globe, half of the world,

72. **accurately**, exactly, carefully.

calculate, count, reckon.

73. **torrid**, burning, parching.

indulge in sleep, to treat themselves to a sleep.

temperate, moderate, not excessive.

industry, hard work.

SUMMARY

PRELIMINARY—PLAN AND MAP

POSITION

When we wish to tell exactly **where** a place is, we state **how far** it is from some other place, and in what **direction** it lies from it.

Thus, if we wish to tell where **Birmingham** is: We may say that it is 112 miles (by rail) north-west of **London**, or we may say that it is 98 miles south-east of **Liverpool**. If we lived at **Warwick**, we should say that Birmingham was 20 miles north-west of Warwick; but if we lived at **Wolverhampton**, we should say that Birmingham was 12 miles south-east of Wolverhampton.

These two things, therefore, **distance** and **direction**, are the means by which we describe or tell the position of a place, and in order that the position of the place may be correctly fixed, both must be able to be accurately determined.

DISTANCE

The standard measure of distance (or length) in Great Britain and in America is the yard, which is divided into 3 feet or 36 inches.

The mile contains 1760 yards, and is the unit used in measuring distances between places. It must be always remembered that in measuring the distance between two places we must measure in a straight line.

DIRECTION

In describing direction it is not possible to use the ordinary terms, *on the right hand, on the left hand, behind, before,* &c., for these terms are not fixed; a person in turning round makes what was behind, before, and what was right hand, left hand.

There are certain **fixed directions** that can be determined independently: (*a*) by the help of the **sun**, (*b*) by the help of the **stars**, (*c*) by means of the **mariner's compass**; these are called the **Cardinal Points**, or **chief points**.

They are so called because all the other points of direction can be got easily when these are known.

The **Cardinal Points** are **North**, **South**, **East**, and **West**.

The Sun.—At noon the sun is due south, and the shadows of objects point north. A person with his back to the sun has his face to the north, his right hand to the east, and his left hand to the west.

Pole Star.—At night, by the help of the pointers in Charles' Wain, we can find the pole star. All the stars seem to move round, and when we are looking at it our face is to the north, our back to the south, our right hand to the east, and our left hand to the west.

Mariner's Compass.—This is a thin strip of steel, perfectly free to move round, and one end of which points always to the north. To it is fixed a compass-card, on which, besides the cardinal points, twenty-eight other points of direction are shown. By means of the compass a person can tell accurately the direction in which one place lies from another.

PLANS

By carefully attending to distances and direction, we can make a **plan**; that is, a drawing showing the position and size of the objects marked on it.

By a plan we mean a drawing of a building, a town, a farm, &c.

Even a very small building cannot be represented full size in a drawing. The drawing would take up too much space. To prevent this, a small line is taken to represent a foot or a yard. The lines, so many yards or feet long, are shown on the plan by lines so many times this small line.

The smaller distance in the drawing which represents the greater distance—the foot-yard,' &c., used in measuring the object, is called the **Scale**.

A **scale** is a line with a number of marks on it at definite distances, and is used for measuring distances on the **plan**.

MAP

A map is a **drawing** intended to show the **shape** and **size** of the part of the world it represents, and the **names** and **positions** of the places, rivers, mountains, lakes, &c., in it.

A map is a drawing of a larger stretch of country than a plan, from which it differs in no other respect.

Of course the scale to which it is drawn is much smaller than the scale to which a plan is drawn; but, as in a plan, so also in a map, the scale must be given to enable us to tell the meaning of what is shown on the map. If the map is drawn on a scale of 10 miles to the inch, that means that every inch on the map stands for 10 miles of land or of sea, as the case may be.

All the **different marks** on a map have **distinct meanings.**

Coast.—The line winding in and out, and all of the same thickness, shows where the sea and land meet, and is spoken of as the coast-line.

Rivers.—The wavy lines, growing thicker as they come nearer the coast, mark the positions and courses of the rivers.

Mountains.—Mountains are sometimes shown by thick lines, sometimes by shading, and sometimes by a number of little lines side by side.

Some maps show also the roads and the railways.

Lakes.—The shores of lakes are shown like the coast. The lakes themselves are, like the sea, left uncoloured, or are coloured blue.

When one part of land is to be marked as distinct, or separate, from another part close to it, the two parts are usually separated by a **line of dots**, and are often coloured differently.

Towns are shown on a map by means of **dots** of various shapes and sizes.

GEOGRAPHICAL TERMS

TERMS RELATING TO SPRINGS AND RIVERS

A **spring** is water rising out of the ground, or flowing out of a hill-side.

EXAMPLES: Thames Head, Seven Springs, Holy Well.

Springs are fed by the rains that fall on the sides of the hills. They are often the sources of rivers. At other times they feed lakes.

In many parts the water is hot, as at Bath and elsewhere in England; while in not a few cases it is boiling, and is driven up at intervals, forming what are known as **geysers.**

There are many mineral springs, of which the best known in the British Isles are those of Tunbridge Wells, Harrogate, and Strathpeffer.

A **river** is a stream of water flowing through the land, and falling into another river, into a lake, or into the sea.

EXAMPLES: The Ouse, the Thames, the Severn, the Mersey in England; the Mississippi and St. Lawrence in

North America; the Amazon and La Plata in South America; the Nile in Africa; the Ganges and Yangtse-kiang in Asia; and the Rhine and Danube in Europe.

The **bed** or **channel** of a river is the groove which it cuts out of the land, and in which its waters flow.

The **banks** of a river are the ground close to the channel on both sides of the stream.

If you stand in the middle of the stream and look the way the water flows, the land on the right side is the **right bank**, and on the left side the **left bank**.

The **source** of a river is where the river begins.

EXAMPLES:—The **Tees** rises on **Crossfell**, the **Thames** at **Thames Head** or in the **Seven Springs**, and the **Severn** on the slopes of **Plinlimmon**.

Rivers for the most part have their sources in the high grounds or mountains, which may thus be regarded as the "cradle" of the rivers. The **Rhine** and **Rhone** rise in the **Alps**, the **Ganges** in the **Himalayas**, and the **Amazon** in the **Andes**. The **Orange River** in the **Drakensberg**.

The **mouth** of a river is where it ends or falls into the sea, or a lake, or another river.

EXAMPLES: The mouth of the Mersey, the Humber, &c.

An **estuary** is the part at the mouth of a river up and down which the tide flows.

EXAMPLES: The estuary of the **Thames**, the **Humber**, the **Mersey**. Note also the estuaries of the **St. Lawrence**, the **Orinoco, Amazon, La Plata, Yangtse-kiang**, and **Ob**.

Waterfalls are formed when a stream passes suddenly from a higher to a lower level.

EXAMPLES: Caldron Snout, High Force and Aysgarth Force on the Tees, falls of the Conway in North Wales. The falls of **Niagara** between lakes Erie and Ontario, and the **Victoria Falls** on the Zambesi, are among the most famous waterfalls in the world, while the **Nile Cataracts** are among the best known.

When a stream flows down a steep slope it forms a **torrent**. When it comes down in a number of small waterfalls it forms a **cascade**.

A **delta** is the name given to the low-lying land formed by a river at its mouths, and shut in between the branches of the river, that spread out at its mouth like a fan. The best-known deltas in the world are those of the Nile, the Mississippi, the Ganges, and the Niger.

Sometimes no delta is formed, the river forming, instead, at its mouth, sand-banks. These impede the navigation, and, where they lie right across the channel or tideway, are called **bars.**

A **tributary** is a stream that flows into a main stream.

EXAMPLES: The Aire, Don, and Derwent are tributaries of the Yorkshire Ouse. The Tame, Colne, Lea, Kennet, Wey, are tributaries of the Thames.

Amongst tributaries almost as famous as their main stream may be mentioned the **Missouri**, a tributary of the Mississippi; the **Ucayli**, a tributary of the Amazon; the **Jumna**, a tributary of the Ganges.

The **main stream** is the stream that gives its name to the united streams.

A **confluence** is where two streams meet, as the confluence of the Thames and Medway, the Missouri and Mississippi, the Ganges and Jumna.

A **river basin** is the part of the country from which a river gets its water, as the "Basin of the Thames", the "Basin of the Humber".

In some cases the river basins are of enormous extent. The basin of the Amazon is the largest in the world, and next to it in size are the basins of the great rivers the Mississippi and the Yangtse-Kiang.

A **watershed**, or **water-parting**, is the ridge of high ground between two river basins.

Rivers are fed by the rains, by springs, and by the melting of the snows, or of the glaciers on the mountains.

A **glacier** is a river of ice, fed by the snows that fall farther up among the mountains.

The lower end of a glacier usually gives rise to a river.

A **lake** is a hollow in the ground filled by water from a river or from springs.

EXAMPLES: Windermere, Ullswater, Loch Lomond in Scotland, Loch Neagh in Ireland. The great lakes of North America, Superior, Huron, Michigan, Erie, and Ontario, &c., are the most famous in the world. Superior is the largest fresh-water lake in the world, and next to it is Victoria Nyanza in Africa.

Usually a river flows out of the lower end of a lake.

EXAMPLES: The Leven out of Windermere, the Crake out of Coniston Lake, and the Derwent out of Derwentwater. The St. Lawrence issues from Lakes Ontario, the Nile from Victoria Nyanza.

Rivers are used as roads for the ships and barges that carry goods between the towns on their banks. They are often also the sources of the water supply of towns. In some parts, as in Spain, Egypt, and India, they are used to water the land.

TERMS RELATING TO MOUNTAINS, VALLEYS, &c.

A **hill** is a part of the ground raised above the level of the country round about it.

EXAMPLES: Leith Hill, Richmond Hill, Muswell Hill, Box Hill.

A **mountain** is the name given to a very high hill.

EXAMPLES: Snowdon, Scafell, Crossfell, Ben Nevis. Mount Everest, the highest mountain in the world, is in the Himalayas. Mount Blanc is the highest mountain in Europe, Kilimanjara the highest in Africa, Aconcagua in South America, Mount St. Elias in North America.

A mountain or hill is mostly of a more or less rounded shape. The highest part of it is called the **top** or **summit**. Where it begins to rise up, is called the **foot**, or **base** of the hill.

A line of mountains, joined by high ground, forms a **chain** or **range**.

When the mountains and their joining high ground are not in lines they form a **group**, as the **Cumbrian mountains** in Cumberland.

The mountains of England are low. The Himalayas, between India and Tibet, are the highest chain of mountains in the world.

The Andes in South America are the longest range of mountains in the world, and, next to the Himalayas, the highest.

A **volcano** is a round hill or mountain, looking like a cone with the top cut off, and having a hollow near the top called a **crater**, from which *gas*, *steam*, *dust*, *mud*, or *lava* is driven out.

EXAMPLES: Etna, Vesuvius, Hecla, Cotopaxi, Popocatepetl.

The hill is made up of the dust, or ashes, or lava, which have been driven up through the hole.

A **valley** is the hollow between two ranges of hills or between two mountains, and has usually a stream flowing through the lowest part of it.

EXAMPLES: The valley of the Thames, the valley of the Severn.

The valleys of the Mississippi, St. Lawrence, Ganges, Nile, are famous.

The deep narrow valleys, which in some parts rivers have hollowed out are called gorges, ravines, and in North America cañons.

A **plain** is a stretch of low-lying nearly level country surrounded by higher.

EXAMPLES: The Plain of York, the Cheshire Plain, the Fens. The European plain in the north of Europe, the plain of Hungary, the plains of Northern Italy, of Northern India, and China are famous.

A **table-land** is a stretch of high-lying nearly level country surrounded by lower.

EXAMPLES: Salisbury Plain, Dartmoor, Exmoor.

When the table-land is crossed by ranges of hills or mountains it is called a **plateau.**

EXAMPLES: The Plateau of Iran, the Plateau of Tibet, and the Plateau of Mexico.

English plains are small in comparison. The great plain of Europe and Asia stretches across the north of both continents from the Atlantic to the Pacific, and is scarcely broken by anything in the shape of a mountain. Plains are called by different names in different parts of the world; thus we have the *tundras* and *steppes* of Siberia and Russia, the *landes* of France, the *prairies* of North America, the *llanos* of the Orinoco, the *selvas* of the Amazon, and the *pampas* of Southern Brazil and Argentina.

A **desert** is a stretch of country which, on account of want of rain, is uninhabitable by man.

EXAMPLES: The Sahara and Kalahari deserts in Africa, the deserts of Arabia and Gobi in Asia.

NAMES OF MEN'S DWELLING-PLACES

A **hamlet** is a cluster of houses smaller than a village.

A **village** is a larger collection of houses than a hamlet, and smaller than a town. It usually includes a church.

A **town** is a larger collection of houses than a village; usually with a market.

A **city** is the name given to a town that has a cathedral, that is, a bishop's church.

It is often used for a very large town, whether it is the seat of a bishopric or not. The title is now sometimes granted to towns by the sovereign; thus, Birmingham is a city.

NAMES OF COAST FORMS—LAND

The **coast** is the part of the land next the sea.

Sometimes the coast is high and rocky, with deep inlets that make excellent harbours; as in Wales and Cornwall. At other times it is low, as on the coast of Norfolk and Suffolk, and has few or no good harbours.

The **beach** is the part of the coast between low-water mark and high-water mark.

Sometimes the beach is taken to mean the low part of the coast close to the water.

A **cape** is a piece of land stretching out into the sea.

EXAMPLES: North Foreland, Beachy Head, Dungeness. In Europe the chief capes are North Cape in Norway, Cape Tarifa in Spain, and Cape Matapan in Greece. In Asia, North-east Cape is the most northerly point, and Cape Romania the most southerly. Cape of Good Hope is the best-known Cape in Africa, and Cape Horn is the most southerly point of South America.

An **island** is a piece of land of **moderate size** with water all round it.

EXAMPLES: Isle of Wight, Isle of Man.

North and South America form a piece of land with water round it, but it is not spoken of as an island.

Australia is the **largest** island in the world, if we do not regard it as a continent.

A number of islands coming together near each other form what is called a **group** of islands, as the British Isles.

A number of such groups in a sea form what is called an **archipelago**; as the East Indian Archipelago.

The larger piece of land from which the island is separated is called the **mainland.**

EXAMPLES: Europe is the mainland of Great Britain. England is the mainland of the Isle of Wight.

A **peninsula** has water nearly all round it.

EXAMPLES: Caernarvon, Cornwall. In Europe the best-known peninsulas are those of Scandinavia, Spain and Portugal, Italy and Greece; in Asia, Arabia and India; in America, Nova Scotia and California.

An **isthmus** is the narrow bit of land joining a peninsula to the mainland.

EXAMPLES: The best known of all isthmuses are those of Suez, between Africa and Asia, and Panama, between North and South America.

NAMES RELATING TO COAST FORMS—WATER

A **strait** is a narrow piece of water joining two larger pieces.

EXAMPLE: The Straits of Dover, between the English Channel and the North Sea; the Straits of Gibraltar, between the Mediterranean Sea and the Atlantic.

A **channel** is a very wide strait.

EXAMPLE: The English Channel, between England and France; St. George's Channel, between England and Ireland; the Mozambique Channel, between Madagascar and Africa.

A **harbour** is a portion of water in which ships may lie in safety during a storm.

EXAMPLES: Portsmouth harbour, Plymouth harbour.

A **seaport** is a town on the coast or near the mouth of

a river, with **docks** or **wharves** at which ships load and unload.

EXAMPLES: Liverpool, London, Hull, Cardiff, Southampton, New York, Rio Janeiro, Hamburg.

A **roadstead** is a place at some distance from the coast where ships can ride at anchor. It is usually sheltered by islands or sand-banks between it and the open sea.

EXAMPLES: The Downs, Yarmouth Roads, Spithead.

THE SURFACE OF THE EARTH

The surface of the earth consists of land and water.

The water covers about three-fourths, and the land one-fourth of the surface.

TERMS RELATING TO THE GREAT DIVISIONS OF LAND

A **continent** is a great division of land, and includes usually several countries.

There are six continents: **Europe, Asia, Africa, North America, South America,** and **Australia.**

A **country** is the land of a nation.

EXAMPLES: The British Isles, Italy, Germany.

A country has usually a government of its own, distinct from that of other nations. Sometimes several countries, formerly distinct, are united under one government.

EXAMPLES: The United Kingdom.

Sometimes great countries, like Australia and Canada, keep up and cherish their connection with the mother-country, or country from which their people come. In such cases the countries are known as colonies.

Different countries are differently divided. England is divided into **counties** or **shires,** and these again into **parishes.** France is divided into **departments,** Russia into **governments.**

TERMS RELATING TO THE GREAT DIVISIONS OF WATER

An **ocean** is the largest division of water.

There are five oceans: the Atlantic Ocean, the Pacific Ocean, the Indian Ocean, the Arctic Ocean, and the Antarctic Ocean.

A **sea**, **gulf**, or **bay** is the name given to a piece of water smaller than an ocean, and having land partly or almost entirely round it.

EXAMPLES: The Mediterranean Sea, Hudson Bay, Gulf of Mexico, Gulf of Guinea, Bay of Bengal.

We cannot tell a **sea**, or a **gulf**, or a **bay** from one another by their shape or their size.

A **sea** means usually a larger body of water than a **gulf** or a **bay**.

A **gulf** is usually a larger sheet of water than a **bay**.

A **bay** is usually a wide opening of the sea between two outstanding points, and does not run far into the land; while a **gulf** has a narrow opening, and runs far into the land.

But these are only generally true.

THE CONTINENTS

EUROPE

Europe is smaller than any of the other continents except Australia.

Europe is more than four times smaller than Asia, more than three times smaller than Africa, and less than half the size of North America.

It is the most civilized and the most thickly peopled of the continents.

The population of Europe is fully 400 millions.

Europeans are for the most part of the white race. With the exception of the Turks and Jews they are all Christians.

The chief mountains in Europe are: the **Alps**, between Italy and Switzerland; the **Pyrenees**, between France and Spain; and the **Apennines**, in Italy.

The chief European rivers are the **Volga**, the **Danube**, and the **Rhine**.

Europe consists of a number of countries. The six chief are:

The United Kingdom. Capital, London.
Germany. Capital, Berlin.
Russia. Capital, St. Petersburg.
France. Capital, Paris.
Austria-Hungary. Capital, Vienna.
Italy. Capital, Rome.

These are called commonly the six **Great Powers.** Besides these there are:

Norway (*Christiania*), Sweden (*Stockholm*), Denmark (*Copenhagen*), Holland (*The Hague*), Belgium (*Brussels*), Luxemburg (*Luxemburg*), Switzerland (*Berne*), Portugal (*Lisbon*), Spain (*Madrid*), Greece (*Athens*), Montenegro (*Cetinge*), Turkey (*Constantinople*), Servia (*Belgrade*), Roumania (*Bukarest*), Bulgaria (*Sophia*).

Russia is by far the largest country in Europe.

ASIA

Asia is the largest of the continents, being not much less than five times the size of Europe.

Much of Asia is under the control of European nations; especially of **Russia, Great Britain,** and **France.**

The **population** of Asia is estimated at twice that of Europe, that is, at about 800,000,000, or **half** the human race.

As Europeans belong to the **white race,** most Asiatics belong to the **yellow.**

The white races, however, possess most of the south and west of Asia and exercise considerable control over the greater part of the remainder.

The chief countries are:

Russia in Asia (*Tiflis, Omsk, Tashkent*), **Turkey in Asia** (*Smyrna*), **Arabia** (*Mecca*), **Persia** (*Teheran*), **Afghanistan** (*Kabul*), **India** (*Calcutta*), **Siam** (*Bangkok*), **French Indo-China** (*Saigon*), **China** (*Pekin*), **Japan** (*Tokio*), **Korea** (*Seul*).

The chief mountains in Asia are the **Himalayas,** north of India, the highest mountains in the world, the **Hindu Kush,** the **Altai,** and the **Kuen Lun.**

The chief rivers of Asia are the **Yangtse-Kiang, Amur, Ganges, Indus, Ob,** and **Yenisei.**

AFRICA

Africa is about three times the size of Europe.

It is connected to Asia by the **Isthmus of Suez,** and forms with Europe and Asia one of the three great masses into which the land of the world is divided, the part called the **Old World.**

Africa is often spoken of as the **Dark Continent.**

This name was given to it partly on account of the fact that its natives are either negroes or very dark-skinned races, and partly on account of the fact that till within the last half-century it was practically unexplored.

The continent is almost entirely under the control of European nations.

The European nations which have the largest possessions in Africa are Great Britain, France, Germany, and Portugal.

The **population** of Africa is variously estimated at from 130,000,000 to 200,000,000.

The chief countries in Africa are:

Abyssinia. Capital, Adis Abbaba.
Morocco. Capital, Morocco.
Liberia. Capital, Monrovia.
Congo Free State. Capital, Boma.

British possessions: Cape Colony (*Cape Town*), Natal, Orange River Colony, Transvaal, Rhodesia, British East Africa, Nigeria, Gold Coast, Sierra Leone, Egypt, Sudan.

French possessions: Algeria, Tunis, French Sudan, French Congo, Madagascar.

German possessions: Togoland, Kamerun, German South-West Africa, German South-East Africa.

Portuguese possessions: Cape Verde Islands, Guinea, S. Thomé and Principe Angola, Portuguese East Africa.

The chief mountains of Africa are the **Atlas** mountains in the north-west, and the **Drakensberg** in the south-east.

The chief rivers are the **Nile**, the **Congo**, the **Niger**, and the **Zambesi.**

Victoria Nyanza is the largest lake.

NORTH AMERICA

North America, the larger part of the New World, is about twice the size of Europe.

North and South America are spoken of as the New World, because their existence has only been known to the people of Europe for a little more than 400 years.

The greater part of North America is in the possession of English-speaking people, for the most part Protestants. The

population of North America is nearly 100,000,000. The population of the United States alone is over 76,000,000.

In the north is the **Great Dominion of Canada**, the capital of which is Ottawa.

This is the largest and one of the most important of British colonies.

South of Canada is the United States of America, nearly equal in size to Canada. Its capital is Washington, but the most important city is *New York*, the second largest city in the world.

Canada and the United States occupy seven-eighths of the entire continent, but the population of the United States is much larger than that of Canada.

Other countries are:

Mexico.	Capital, Mexico.
Central America States.	Guatemala, San Salvador, Nicaragua, Honduras, Costa Rica.

Mexico and Central America are occupied by people speaking a form of Spanish. The people are either Spanish, half-breeds, or native Americans called Indians or Red Men.

The chief mountains of North America are the **Rocky Mountains** in the west.

The chief rivers are the **Mississippi**, the **St. Lawrence**, and the **Mackenzie**.

Of the lakes, **Superior** is the largest fresh-water lake in the world.

Between North and South America are the **West India Islands.**

SOUTH AMERICA

South America is about twice the size of Europe. Its entire **population** is less than that of the United Kingdom. Only about a third are Europeans.

These are chiefly of the Latin races, Spaniards, Portuguese, and Italians. The rest are mainly half-breeds or native American Indians.

South America gave us potatoes, tobacco, cocoa, india-rubber.

The chief countries in South America are:

Colombia (*Bogotá*), Venezuela (*Carácas*), Ecuador (*Quito*), Peru (*Lima*).

Bolivia (*La Paz*), Chile (*Santiago*), Brazil (*Rio Janeiro*), Uruguay (*Monte Video*), Paraguay (*Asuncion*), Argentina (*Buenos Ayres*).
Guiana includes British, Dutch, and French Guiana.

The chief mountains of South America are the **Andes**, along the west side, the longest range in the world.

The chief rivers are the **Amazon**, the **Orinoco**, and the **Parana**.

AUSTRALIA

Australia is almost a fourth less in size than Europe, while its population at present is nearly one hundred times smaller.

The population is almost entirely of British descent.

This continent, together with the island of Tasmania, has just been formed into a commonwealth, under the title the "**Commonwealth of Australia**".

The **Commonwealth** consists of the following states:

New South Wales (*Sydney*), Victoria (*Melbourne*), Queensland (*Brisbane*) S. Australia (*Adelaide*), W. Australia (*Perth*), Tasmania (*Hobart*).

The chief mountains are the **Australian Alps**, and the chief river is the **Murray**.

New Zealand, fully a thousand miles east of the southern part of Australia, is rather less in size than the British Isles.

New Zealand consists of North and South Island and Stewart Island.
The capital of New Zealand is **Wellington**.
Besides Wellington, **Auckland**, **Christchurch**, and **Dunedin** are important towns.

Australia and New Zealand are the great **wool-producing countries**. They also produce large quantities of gold.

Besides Australia and New Zealand there are a great number of island groups in the Pacific. These are often, taken altogether, called by the name **Oceania**.

OCEANS

The **Pacific Ocean** is the largest of all the oceans.

It is more than twice the size of the Atlantic or Indian Ocean, and more than one and a half times the size of all the land on the globe. It is shaped somewhat like a horse-shoe, closed towards the north. The Pacific opens to the Arctic Ocean by a single narrow passage, **Behring Straits**, but towards the Antarctic Ocean it spreads out widely.

The **Atlantic Ocean** is the most important of the oceans, because it is the highway of trade between Europe and America, and Europe and other parts of the world.

It is shaped like a long canal, and is connected with the Arctic Ocean by rather narrow passages.

The **Indian Ocean** is rather larger than the Atlantic Ocean, and is shaped, like the Pacific, somewhat like a horse-shoe.

Unlike the Pacific, it is entirely closed in the north.

Regarding the **Arctic** and **Antarctic** Oceans very little is yet known.

THE SHAPE AND SIZE OF THE WORLD

The world is round, somewhat like a ball or orange.

It is not quite round, but is a little flattened towards the poles.

PROOFS.—We know that the earth is round because—

(*a*) The shadow of it cast on the moon during an eclipse is always part of a circle.

(*b*) The hull of a ship is the part that is first lost sight of when a ship is going away, and the top of the mast the part first caught sight of when it is coming nearer.

(*c*) The horizon is always circular.

(*d*) If three vertical poles be placed in a line, each the same height above the level of the water, it is found that the top of the middle pole is above the level of the line joining the tops of the two outside poles.

(*e*) Sailors have sailed round the world.

The earth is a very big ball indeed.

It is so big that if there were a tunnel through the centre from one side to the other, it would take a man more than half a year to walk through it, travelling 12 hours a day and 3½ miles an hour.

It would take a railway train, going 50 miles an hour, three weeks to go round it.

Its diameter is nearly 8000 miles, and its circumference 25,000.

The total surface is nearly 200,000,000 square miles (197,000,000), or between 1600 and 1700 times the size of the British Isles.

The land is over 50,000,000 square miles, or, roughly, 400 times the size of the British Isles.