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CHATTERBOX.



"How dare you keep me waiting, slave?'"

THE DIM RED DAWN.

By MRS. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c. Illustrated by E. S. FARMER.

[NOTE.—Mrs. Hobart Hampden is very well known to readers of Chatterbox, as well as to many others. She is the author of several serial stories (many of which have since appeared in book form and can be obtained of the publishers of Chatterbox). Most of her tales have been of Indian life, which she knows well (some of the titles appear above). But THE DIM RED DAWN is something quite new and different.

It is a tale of life in England-life, may be, all over the world-as it was when the earliest men dwelt on a land many feet lower than it now is, and many thousand years before us. An article on that kind of existence appears on page 15, with illustrations to prove it true; for these things are true. People like Zend and Zip-Zip in THE DIM RED DAWN did really live, and they are our ancestors. They did not talk exactly as they talk here; but they did exchange knowledge and ideas by means of some sort of speech, and so handed on to us so many generations later the mind and life that God gave them. If we met them now, we should most likely think they were only grunting, and were very dirty, savage and cruel. But they really existed, and THE DIM RED DAWN tells us, in our speech, how, in all probability, they went through their exciting careers. Their instincts have become our habits and customs. (See also page 15.)

E. S. Farmer, who illustrates the story, is also well known to Chatterbox readers, having done the pictures for that popular story, The Wooden Heads, for The Caravan Cousins, and many other tales. THE DIM RED DAWN runs throughout the volume; a second but rather shorter serial story will start later.]

CHAPTER I. -TRIBAL LAW.

LULU, of the tribe of Zend, and Zip-Zip, the small slave girl, her companion, had been trying to spear fish through a long afternoon, but had met with little success. Then, suddenly, there was a silver gleam amidst the river ripples, and out flashed Lulu's throwing spear in answer. A moment later, guided by the float attached to the spear-shaft, she and Zip-Zip waded knee-deep into the water, and dragged a ten-pound salmon to shore. The spear had sunk deep; the fish was practically dead already, and it gave them little trouble.

'Good,' said Lulu, and sat down upon the river bank to rest. But she could never be quiet long; she eyed the cool water, and pulled out the carved mammoth ivory pinsthat held together at the shoulders the skins in which she was dressed. Zip-Zip was clad in skins, too, but of less fine quality. She had skewers of wood instead of ivory. She, too, shed her garments now, and dived after her mistress into a deep pool. They chased each other gaily, in and beneath the water, till Lulu, tiring of the game, caught at an overhanging branch and pulled herself to shore.

'Time to go home; it will soon be dark,' she announced. And when the two had dressed themselves again, and Zip-Zip had found a stick on which they could sling the fish and so carry it between them, they set off in the direction of the huts where lived Lulu's tribe.

Many strange beasts that have now disappeared then roamed the English countryside, for this was many thousand years ago.

There were no villages, no fields, no towns: but forests everywhere, with here and there a man-made clearing. Each was the property of a different tribe, which guarded its huntinggrounds and fishing-waters jealously lest it should die of hunger; and also raided its neighbour's when it dared. Zip-Zip had been captured while her people were trespassing. 'Zip-Zip, the arrows went,' she had wailed when caught, terrified; and Zip-Zip had been her name ever since.

Lulu might have liked the England of today; she certainly liked the England of her time. She loved hunting; she loved fishing. She was as successful at both as any boy of her age. Her uncle, Bobo, in whose hut she had lived since the death of her parents, made much of her. True, she disliked both her aunt, Dilda, and her cousin, Brild, but there was always Zip-Zip at her service; Zip-Zip, who was now trying to shift most of the weight of the fish to her own shoulder, till Lulu, frowning, readjusted it. The settlement was already in sight; a huddle of little huts round the chief's large hut in the centre. The huts were thatched and raised on wood piles to keep the floors dry in wet weather. Lulu glanced at the chief's hut and Zip-Zip's eyes followed hers.

'Zend, the chief, is very ill,' said Zip-Zip. The bison he was hunting yesterday tore all

his side open, so they say.'

'Um!' said Lulu, briefly. She liked Zend. He was very brave, and no bully, though he was by far the strongest man in the tribe.

Zend liked salmon, she remembered; possibly she might give him a piece of hers. Outside the chief's hut, Ullah, his wife, was bending over a fire, stirring some liquid in a burnt clay pot.

'If Zend is hungry, here is salmon,' said Lulu, loftily, as she passed. Her kill, by tribal law, was her own. Not even the chief was supposed to touch it without her leave. She was both surprised and annoyed when Ullah shook her head instead of accepting her offer promptly.

'Zend will not eat. He has eaten nothing since the bison gored him. He scarcely speaks save to the child. But he is thirsty, and I am making him a little broth,' Ullah explained, however. Sighing, she bent to her task again, and Lulu strolled on towards her own quarters.

Brild, catching sight of his cousin and the salmon at the same moment, yelled shrilly with delight. 'Here is Lulu with salmon,' he squealed. 'Now we shall all have salmon to eat.'

'Not until I give it you,' Lulu reminded him, coldly. 'And you are not to pick out the liver with your finger-nails as you did last time when my back was turned.' She glared at Brild, and Bobo, the owner of the hut, who had been listening, laughed. He was lounging in his hut doorway, a flint implement in his hand, with which he was carving a picture on a tooth that had once belonged to a cave bear.

'Stand up for yourself, Brild,' said Bobo. 'You should have been the girl, and Lulu the boy.'

Stand up for your own son,' his wife, Dilda,

retorted over his shoulder.

Then she fell on Zip-Zip. 'How dare you keep me waiting, slave?' Dilda questioned angrily, caught at Zip-Zip's pigtail, and dragged her by it into the hut, boxing her ears. Meanwhile Lulu watched, scowling. She dared not interfere directly with her aunt, nor dared her aunt attack her, for Bobo allowed no fighting that inconvenienced him, and he had a heavy hand. Quarrels, consisting of words only, amused him, but he must not be made uncomfortable. Dilda would not hurt Zip-Zip sufficiently to prevent the child working, he knew, and that, from Bobo's standpoint, was all that mattered. Lulu waited sullenly, therefore, until the whimpers had died away. Then, having climbed a tree that overshadowed the hut, and hung her salmon from a bough safe from night-feeding beasts, she made a face at Brild, and, pushing aside the deerskin that hung over the hut door, she went inside.

It was somewhat dark; the only light came from a hole in the roof through which the smoke escaped when, in wet weather, a fire was lit on the flat hearthstone beneath it instead of outside. Around the hut ran a raised platform of beaten earth, covered with rushes and heather, on which the entire household slept. Close to the hearthstone was a slab on which bones could be cracked; other furniture there was none. Zip-Zip was crouching by the slab, a flint hammer in her hand, with which she was splintering the marrow bones of a wild pig. Her face was tear-stained, and one cheek was bruised and scratched.

'You shall have the salmon liver. I have forbidden Brild to touch it,' Lulu whispered, while Dilda looked at her niece suspiciously from where she lounged on the platform, combing her hair. It was long and reddish, and Dilda was very proud of it. She had pestered Bobo until he had made her a long-toothed comb, on which was the carving of a woman supposed to resemble herself. Dilda spent hours rubbing fish-oil into her scalp, and combing industriously.

'Leave Zip-Zip alone,' Dilda ordered. 'She has idled enough for one day. And beating her makes my hand shake, and then I tear out

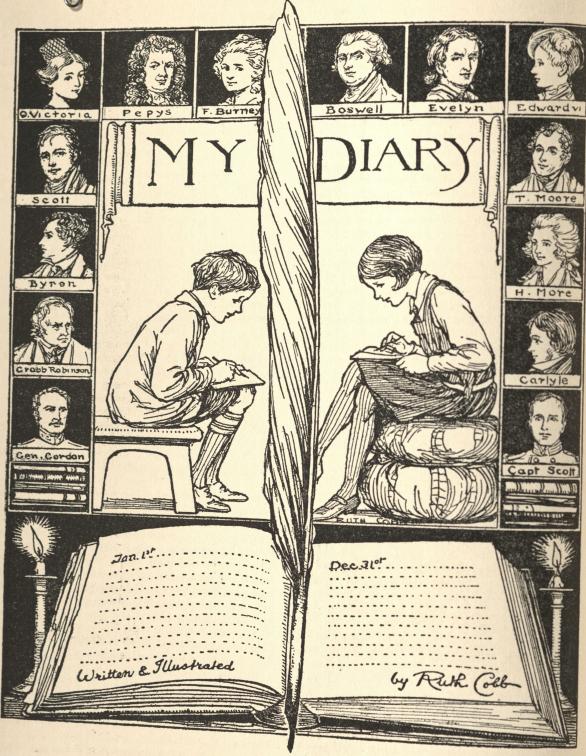
my hair,' she complained, peevishly.
'Then why do you beat her?' Lulu demanded. But Dilda only scowled; and Lulu rummaged amidst the rushes that formed her own mattress for a necklace of wooden beads of which she was fond, and which had belonged to her mother. She hung it round her neck and went out again to stroll round the settlement and listen to the gossip of the day. The necklace made her feel more important and older, for, as a rule, the younger members of the tribe did not possess ornaments. Lulu yearned for the time when she would take her due place in the tribal councils, the right of every grown woman, since the women looked after the small children and knew their needs, and children were useful to the tribe as a whole, for a large tribe was more powerful than a small. Jerking her head until the necklace swung from side to side, she sauntered towards the nearest group. Outside each hut fires were burning, and men and women were clustering round them.

'Oh, look at her!' Brild jeered from a safe distance. 'She thinks that she is beautiful. Ha! ha!'

Lulu turned to put out her tongue at him, then on she strolled.

(Continued on page 14.)

CHATTERBOX.



Some Diary-Keepers.

MY DIARY.

Written and Illustrated by RUTH COBB.

[NOTE.—This series—by Miss Ruth Cobb, the daughter of a famous novelist, and the sister of an author as well known to Chatterbox readers as she is herself, Mr. G. Belton Cobb, author of Twenty Pounds from Uncle Rodney, &c.—covers a great deal of interesting things; private and personal things, queer anecdotes, real history—everything that people have had in their mind at odd times and sometimes put down on paper. There is nothing truer or more human than a real diary.]

I.-DIARIES: WHY KINGS AND QUEENS KEEP THEM.

O you keep a diary? If you do, I wonder why? There are many kinds of diaries, some kept by those who have known interesting and famous people, and whose lives have been concerned with epoch-making events. They kept an account of these things knowing that it would be of interest afterwards. There are other people who have kept diaries all their lives for no apparent reason. They did not write down their secret ambitions, their hopes and fears, but just simple ordinary things-'A showery day, the first crocus opened, Bessie burnt the cake,' and entries like these went on and perhaps still go on from year to year. Often no idea that such diaries would ever be read by anybody but themselves, can ever have entered the head of the writers.



King Edward VI. at his Diary.

Many simple diaries written long years ago have been brought to light, and many more may yet be discovered. Some are extremely valuable, for they show us the kind of life that was lived in England in the past. Such is the

diary of a Norfolk clergyman named James Woodford, who lived in the eighteenth century, and who wrote an account of his daily doings. It is written very shortly, but yet is long enough to give a vivid picture of the way his time was spent with his household and friends, with only



Queen Victoria, as a young girl, keeping a Diary.

the very slightest reference to the stirring political events of the time. He evidently got a great deal of enjoyment from what he ate, and constantly gives the menus of the enormous meals of which he and his friends all partook. These were followed by such frequent indigestion that he also mentions the medicines that had to be taken in consequence. On April 8th, 1782, the dinner consisted of—

'1st course, Fish, a Piece of Rosted Beef, Mutton stakes, Pork stakes, Pea Soup, Potatoes baked, Yorkshire Pudding.

2nd Course, Fricassed Fowl, a rosted Pig, Jellies, Tartlets, Pickled Salmon, and Cheese Cakes.'

Surely a sufficient meal!

There are also diaries where trouble has been taken that they should be secret, as by Samuel Pepys, the greatest of diarists. There are diaries of secret thoughts and desires which

were only expressed in this way by the writer, and which give a side of themselves that the people with whom they passed their lives would never have suspected to exist, so different did they appear in their outer selves from their

inner selves.

There are diaries written by men of action, soldiers, sailors, and explorers, with accounts of expeditions, or for special purposes, which would not have been kept in the ordinary way. There are also diaries that are 'fakes,' written expressly to deceive people, often as a joke, but generally found out sooner or later. Many other diaries may yet come to light. What would not we give for diaries of some people whose works are famous, but of whose actual lives we know but little? What if Shakespeare had kept a diary? That idea has already been used as a theme for the story-writer.

Monarchs as well as their subjects have kept diaries. The boy King Edward VI. wrote one that has come down to us, entirely in his own handwriting and with somewhat variable spelling. He had many masters, and learnt his lessons with other boys carefully chosen from noble families, and with these he lived in a special household, just as if he was at a boarding school. There was one difference between him and his companions—he was not allowed to receive chastisement himself, but was supposed to gain moral benefit by seeing others receive it. It is said that a boy was kept in the household as a whipping-boy specially for that purpose.

Edward VI. learnt writing of one Roger Ascham, a schoolmaster also to his sister Elizabeth, the future Queen of England, and famous as author of several books on education. The young king began his diary before he was twelve years old, and starts by telling of the events of the previous three years. It consists of a folio paper book of sixty-eight leaves. On the fly-leaf is an unfinished drawing of the Royal Arms crowned with the Garter, partly coloured and gilt. He calls it 'A Chronicle,' and the words are written by his own pen at the top of the first page, but smeared while the ink was wet. That makes it seem real, does it not? The diary as a rule is quite impersonal, dealing with all the public events he is concerned with, though every house he lives in is carefully entered. There is no other entry on that date, e.g., '21st Jan. 1551, Removed to Westminster.' 27th Sep. 1551, Removing to Hampton

Of any entertainment he has enjoyed he tells

more in detail. On June 19th, 1550, he says: 'I went to Deptford, where before supper I saw certain [men] stand upon the end of a boat and run at one another till one was cast into the water. After supper was there a fort made upon a great lighter on the Thames which has three walls and a watch tower in the middle with forty or fifty soldiers in yellow and black.' He gives a full account of the sham fight which followed. On July 20th, 1551, he writes a little more of himself. A great French nobleman is visiting the court. 'He, the marshal St. Andrèe, came to see mine arranging and saw my bedchamber-went a hunting with hounds and saw the shoot and saw all my guard shoot together. He dined with me, heard me play on the lute, came to me in my study, supped with me and so departed to Richmond. On April 2nd is a brief entry: 'I fell sike of the Measels and small pokkes'-nothing more: that is the original spelling. The last entry in the Diary is on Nov. 20th, 1552, and the young King died the following July. We can picture him seated at his desk (ornamented with copper and gilt) as he slowly wrote his entries.

Another English monarch, Queen Victoria, kept a diary all her life, beginning when she was thirteen years old and only ceasing at her death when she was eighty-two. It is in a hundred volumes with daily entries, many of them about quite simple things as well as important affairs of State. They are are not even very well written, but are perfectly natural. That she re-read her diaries is certain, for in her old age she made notes in the margin, and as her life went on she may have wished to refresh her memory on past events. Kings and Queens have got to have good memories; and that is why they and many lesser folk keep

diaries.

The first entry is very simple, such as would be expected from the little Princess Victoria,

describing a journey :-

'1832. Wed: Aug: 1st. We left K.P. [Kensington Palace] at 6 min. past 7 and went through the Lower field gate to the right. We went on and turned to the left by the new road to Regents Park. The road and scenery is beautiful. 20 min. to 9. We have just changed horses at Barnet, a very pretty little town. 5 mins. past ½ past 9. We have just changed horses at St. Albans,' and so on. A momentous entry came on Tuesday, 20th June, 1837, when because of the death of her uncle, William IV., she succeeded to the throne of England. 'I

was awoke at 6 o'clock by Mama who told me that the Archbishop of Canterbury and Lord Conyngham [the Lord Chamberlain] were here and wished to see me. I got out of bed and went into my sitting room (only in my dressing gown) and alone and saw them. Lord Conyngham then acquainted me that my poor Uncle the King was no more . . . and con-

sequently that I am Queen.'

Queen Victoria married a distant cousin, Prince Albert of Saxe-Coburg-Gotha. enters in her diary her first feelings about him. 'It was with some emotion I beheld Albert who is beautiful—he is so handsome and pleasing." It is not permitted, not considered etiquette, for any one of lesser rank to propose marriage to a reigning Queen; she had to suggest it herself, and she describes her proposal to him. 'At about ½ p. 12 I sent for Albert: he came to me where I was alone and after a few minutes I said to him that I thought he must be aware why I wished him to come here and that it would make me too happy if he would consent to what I wished (to marry me) . . . I told him I was quite unworthy of him, he said he would be very happy.'

Some of Queen Victoria's Journal of her holidays with her family in the Highlands of Scotland was published during her lifetime, and she gave the money from their sale to found scholarships for the people on the royal estate at Balmoral. She delighted in the simple life there, and illustrated these diaries with her sketches. No exciting adventures befell her, but she went into distant parts of the Highlands 'incognito,' and was much amused and delighted at being supposed to be just an ordinary person.

'Tuesday Oct. 8, 1861. We reached the inn of Dalhousie. Here again there were a few people assembled and I thought they knew us, but it seems they did not; it was only when we arrived one of the maids recognised me... Unfortunately there was hardly anything to eat, and there was only tea and two miserable starved Highland chickens without any potatoes. No pudding and no fun, no little maid (the two there not wishing to come in, not our two people—who were wet and drying our and their things—) to wait on us! It was not a nice supper; and the evening was wet.'

But behind all these simply written happenings there is a feeling of something else besides, the influence that was felt by many who came in contact with the writer. As Queen Victoria grew old, a lady-in-waiting entered

the details of functions in the diary, but till the last the Queen herself wrote the more personal entries. As time goes on more and more of these diaries may be published. Only certain pieces can be read at present, but people can still get a true picture of a woman who from the mere fact that she was a woman, and one who reigned for long, had so great an effect on the England of her times.

ON AN OLD VOLUME OF 'CHATTERBOX' (1868).

I LAY you gently on a shelf,
Friend of mine,
And keep you solely for myself,
Friend of mine.
You're getting rather thin and worn,
Your pages might be quickly torn,
Friend of mine.
A truth you taught me long ago
Has helped me tramp through heat and snow,
And you are precious still, you know,
Friend of mine!
E. E. TRUSTED.

LITTLE DUNCE!

HOW many of us know what it is to stand on one foot, growing scarlet in the face in the vain attempt to remember the answer which we knew so well when we went to bed last night?

And after all, what is a dunce? Dr. John Duns Scotus was the first, and a very clever scholar. But if so, how did the name 'dunce' arise?

In the middle ages certain theologians were called 'Schoolmen,' because they had been trained in the cathedral schools founded by Charlemagne, and the most famous of these Schoolmen was a certain John Duns Scotus. For a time the Schoolmen's writings were much admired, but later on they fell into disfavour, partly because they were not written in classical Latin, and partly because what they wrote about ceased to be attractive; and so it began to be thought clever to break away from them and take up newer ideas.

Those who still clung to the Schoolmen would seek to strengthen their position by referring to the famous doctor, who was familiarly called 'Duns,' while the other side would contemptuously say, 'Oh, you are a Dunsman,' or more briefly, 'You are a Duns;' and as the new kind of learning grew stronger the title became more and more one of scorn. Later on Tyndal refers to 'Dunce's disciples.'

It is very hard lines on one who was so clever to have his name used as a by-word for stupidity, but I am afraid it will not make us any happier to know this the next time we are called 'Little Dunces.'

C. E. THONGER.

PUZZLE MONOGRAMS.

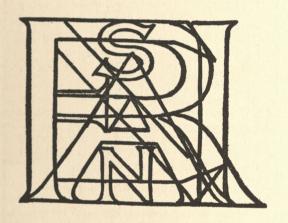
THE CARPENTER'S SHOP.

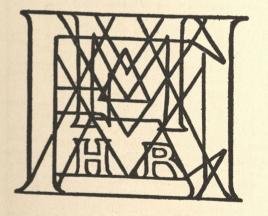
FROM time to time Chatterbox has contained what may be called Puzzle Monograms—a pattern of letters placed across or on top of one another in such a way that no one letter is really quite by itself. These letters, arranged properly, make up a word which fits into the general description given under the Monograms. The solutions of those shown below are provided on page 19.

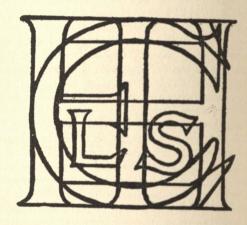
But the Editor of *Chatterbox* has been asked about the best way to solve these puzzles.

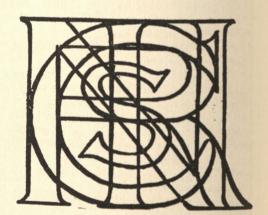
Well, he finds them difficult to solve himself; he has to ask the artist, an old *Chatterbox* friend, Mr. Cooke, to give him a key.

One way is to have several coloured chalks and draw a thin faint line, in a different colour, down each letter you can make out; put down on a piece of paper those you get thus, and you will soon guess the word. If you do not wish to mark your copy of *Chatterbox* (and it is a good thing to keep it clean, because there is plenty to read in it and there are many other people who want to read it), use a thin piece of paper to trace the design, and put your chalk lines on that.









A Puzzle Monogram.

What objects in a Carpenter's Shop do these hidden letters spell?



"She somehow managed to reach Vincent."

WHITE DOCTOR.

'Comfort every sufferer, Watching late in pain: Those who plan some evil From their sin restrain . . .

IMMIE, Sylvie, and Vincent had sung their evening hymn, and kissed Aunt Dollie good-night, and were all off to bed. But Vincent ran back, and climbing on to Aunt Dollie's knee, he asked:

'What does it mean, Aunt Dolly? what is

"watching late in pain?",

'You darling!' cried Aunt Dollie, hugging him. 'Oh! it only means when we're awfully ill, and can't go to sleep. Don't think about it. Run away and go to sleep yourself!'

'Vincent might have known that,' said Jimmie: 'because when we play "Hospital" all the dolls are ill in bed, and when they're getting better they go to sleep ever so quietly, and we say "White Doctor's come"!'

'Yes!' added Sylvie in a solemn voice: 'and when they're getting worse, and worse, and die—it's Black Doctor, and we bury them

in the garden . . .'

'But of course we dig them out,' interrupted Jimmie cheerily, 'before they're spoiled!

Aunt Dollie laughed, and said:

'Run away now, all of you. You're tired, and White Doctor is waiting for you, to make you nice and fresh for the morning on the sands.'

Jimmie, Sylvie, and Vincent were spending their summer holidays with Aunt Dolly at her cottage by the sea. Their governess had gone home for her holiday, and Nannie was generally busy with Baby Pearl, so that the three children were left a good deal to themselves. The morning after they had told Aunt Dollie about White Doctor, they were all on the beach making a big sand-castle. Nannie was sitting sewing a little way off, with Baby Pearl asleep in her pram. Vincent soon got tired of the castle, and ran down to paddle. Nannie happened to look up, and called:

'Come back, Vincent! Don't go so far out

all alone.'

Vincent came back. But presently he saw a lovely jelly-fish floating a little way out, gleaming and shimmering in the water. It looked only a tiny bit deeper there, and he thought he might venture after it. Then suddenly the sand seemed to be sucking him in! He turned and tried to go back, only to find himself sinking deeper and deeper!

Terrified, he screamed as loud as he could. Nannie jumped up, and rushed down the beach, shouting: 'Come back, Vincent! Do you hear? Come back at once!'

Jimmie and Sylvie ran too, splashing into the shallow water. But Vincent could only scream and struggle. Then Nannie guessed

what had happened.

'Go back, you two!' she screamed; 'go back at once!' And still louder she screamed: 'Help! help!' while the shiny sand rose almost to her knees. But she managed to reach Vincent, and seize him by the shoulders. His eyes were closed, and he was far too frightened even to scream any more.

Just then a boatman came clattering down the beach, and splashed up to Nannie, and took Vincent in his arms. Nannie struggled after him, and all were soon in safety.

'We has a lot of trouble with them quicksands,' said the boatman. 'The kiddies will

go out too far, you see.'

Nannie thanked him, and asked his name. 'Will you come up to the cottage this afternoon?' she said. 'I'll tell Vincent's auntie I must go and put him you saved him.

straight to bed now.'

Then, turning to the two frightened children, she added: 'Jimmie, you and Sylvie stay here beside Baby Pearl. Don't move now! promise, till I come back for you.'

'Vincent is in bed,' said Nannie, when she returned, 'and your uncle is with him.'

Now Uncle Bobbie was a real doctor, so Jimmie looked rather grave when he heard this, and asked: 'Is Vincent ill then, Nannie?'

Sylvie began to cry, as Nannie replied: 'Well! he may be, unless we take great care of him. It was such a shock, and he's such a little boy. You two must be very good, and quiet for the rest of the day, mind you,' she said severely, as they entered the cottage.

Jimmie and Sylvie felt far too sad to want to make any noise. The day seemed terribly long. But at last it was time to go down to Aunt Dollie for evening prayers. Their voices shook singing their hymn at the words:

> 'Comfort every sufferer, Watching late in pain . . . '

and Sylvie couldn't help sobbing. Aunt Dollie kissed her, and said:

'Don't cry, darling. When you're in bed

Uncle Bobbie will come up and tell you how Vincent is. I'm sure he will soon be better.'

The two children thought they had been in bed hours and hours waiting for Uncle Bobbie to come. Sylvie had been dozing uneasily, and footsteps in the passage quickly wakened her.

'Oo-oo! I dreamed it was Black Doctor come for Vincent!' she whispered in a scared voice, clutching at Uncle Bobbie's hand as he sat down on her bed.

'No, no!' said he, in his big, deep, comfort-

ing voice; 'no, no! silly girlie! You can go to sleep, and be quite happy now. Vincent has been very ill all day, but White Doctor has just come, and he will be all right in the morning. Good-night, both of you,' added Uncle Bobbie, as he got up to go.

'Good-night, Uncle Bobbie!' replied Jimmie

heartily, 'thank you ever so much!'

'Good-night,' murmured Sylvie, already half asleep, 'and thank you . . . dear White B. FRASER FORBES. Doctor.'

WATER POWER.

By P. M. BAKER, B.Sc., M.B.E., A.M.I.E.E., A.M.I.Mech.E.

Illustrated by BERNARD WAY.

[NOTE.-Mr. P. M. Baker, who has already contributed other fascinating articles on engineering to CHATTERBOX in previous years, is really one of the men who won the Great War. He was called to the very highly skilled staff of the Ministry of Munitions during the war, and served there throughout it. The technical knowledge which the long row of letters after his name proves was what was wanted. Now he is in charge of a huge electric power station near London.

The illustrations are also by a skilled engineer, Mr. Bernard Way. There will be several articles in this series, each dealing with the very latest facts about their subjects. In spite of the many books there are about engineering, much of the information given here has never been put into print (outside engineering or scientific papers) in simple form before.]

WE all know how we can obtain power (necessary for all machinery, and so for all we do) by the generation of heat energy by combustion (as in an Internal Combustion Engine*), and by its conversion into mechanical energy by processes which are far from being efficient, for at the best we can only usefully employ less than a third of the heat units of the fuel and in most cases less than one tenth. The original source of the power in these engines is the vast stock of fuel formed by Nature ages ago, but, as the engines form a starting-point in the production of mechanical energy, they are frequently called 'prime movers.' The petrol engine in a motor car is a prime mover, as is also the steam engine or steam turbine in a generating station; but the electric motor which drives a railway train is not a prime mover.

Power obtained by means of Water .- Waterfalls or rivers in which we have rapidly moving water, even the tides, provide us with a readymade source of power requiring only the installation of means of utilising it. It very often happens that the cost of installing apparatus to utilise the power which Nature provides in this way would be so great that it is cheaper to use heat engines and burn fuel, even if it is expensive, rather than to spend our capital, on which we have to earn interest, on the necessary works. But that is a question which we cannot enter into more fully here, and any way there are two sides to this, as to all questions! The original source of water power is really the sun which, by causing evaporation of sea water, and so supplying us with rain, is the ultimate cause of the existence of the rivers and lakes from which this power is obtained.

Some elementary Theory .- When we see a stream tumbling over a waterfall, or perhaps flowing over a weir, such as those at the locks on the Thames, we naturally wonder what power it would be able to give us if we 'harnessed' it. In order that we may be able to decide these matters for ourselves we must study a little very elementary theory and then see how it is to be applied.

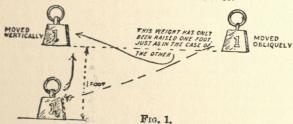
The Unit of Work .- We must start by understanding what the engineer means by 'work' and how he measures it. If a weight of one pound is lifted a vertical height of one foot, the work done is called a foot pound (fig. 1), for we have exerted a force of one pound through a distance, in its own direction, of one foot. Similarly, if the pound weight falls from one level to another which is one foot lower, whatever route it may take and however long the actual distance which it travels, it does one foot pound of work in the

^{*} See Chatterbox for 1926, and The World of Machines (Wells Gardner, Darton & Co., Ltd.).

operation. Work, then, is the product of the force exerted (measured in pounds) and the distance (in feet) through which it acts. The water in a still sea can do no work (leaving out of account the tides for the moment) because, although it contains a tremendous amount of water, it is already at sea-level and it cannot therefore, go any lower. Of course, the tides and sometimes the waves make this statement inaccurate, for they represent energy which has been given to the water; but the general fact

DEFINITION OF FOOT POUND

ONE FOOT POUND OF WORK IS DONE WHEN WE RAISE
ONE POUND THROUGH A VERTICAL HEIGHT OF ONE FOOT



that here we have a tremendous amount of water but no fall, and therefore cannot obtain

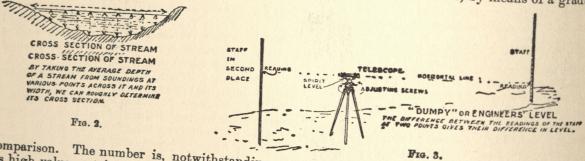
any energy from it, is true.

Power.—The next of the engineers' terms which we must understand is 'power.' What is power? By this term the engineer means the rate of doing work. James Watt estimated that a really first-class horse could do 33,000 foot pounds of work in a minute. It is now known that this is a good deal more than even the best horse can do continuously, but James Watt did not wish to overstate the power of the engines which he built and thus disappoint his customers, so he took the best amount that any horse could possibly be expected to do as his standard for

What Power can be obtained from a Stream? -When we desire to find out what power we can get out of a stream we obviously have to determine two things, (a) the quantity of water which flows down the stream per minute, and (b) the height through which the water falls. It is not very easy to measure the amount of water which flows down the stream, but we can make a rough estimate if we measure the depth at various points and the width, as these will give us the cross-section in square feet of the stream (fig. 2); and we can measure the rate of flow by dropping bits of wood in the water and timing them as they flow a measured distance -say, three hundred feet down the stream. We can then take the average as being rather greater than the true speed of the stream, for the water moves faster in the middle than alongside the banks and at the bottom. Then the quantity of water (q) delivered by the stream per minute, if we make all our measurements in feet and our times in minutes, is naturally the product of the speed (s) and the cross-section area (a) $q = s \times a$

This result, which is only rough, is in cubic feet per minute, and to convert it into pounds per minute we must multiply by $62\frac{1}{2}$, as the weight of a cubic foot of water is about $62\frac{1}{2}$ pounds. For important work, when accurate figures are required, a weir is sometimes built across the stream and the flow determined by the depth of the water flowing over its top edge.

The accurate determination of the fall is also a difficult matter. The engineer uses a 'dumpy level,' an arrangement consisting of a telescope with a spirit level attached to it, by which he can project a horizontal sight line up and down the stream, and measure, by means of a gradu-



comparison. The number is, notwithstanding its high value, retained, and the power developed by a machine or engine which is able to do 33,000 foot pounds of work in one minute is called one 'horse power.'

JUIIII ITMP

ated rod or 'staff,' how far it is above water level up stream and down, and by their difference he measures the head (fig. 3). If there is a weir (figs. 4 and 5) this measurement is much simplified, for we may assume that all

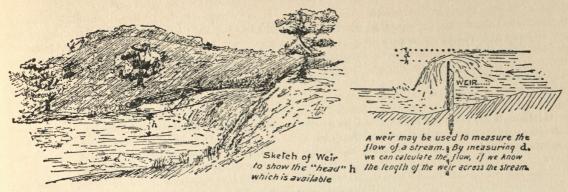


Fig. 4.

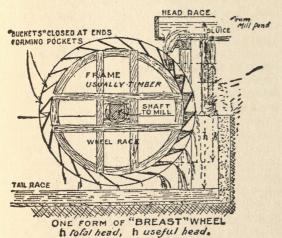


Fig. 6.

the fall occurs over the weir, and measure its height (h) in feet. When we have done this we can calculate in this way—

(1) Work (e) done by the stream in one minute is the weight of water delivered by stream per minute multiplied by the fall in feet; $e = 62\frac{1}{2} \times q \times h$ foot pounds per minute.

(2) Horse power = $\frac{e}{33,000}$

This result is the total power represented by the stream, and we can only utilise some part of it, as there are sure to be some foot pounds lost in the process of obtaining the power, probably over twenty per cent. of the total even if we use quite good apparatus for the purpose.

The Apparatus used for generating Water Power.—It is scarcely correct to talk of generating water power, as the power is already in existence, and our appliances simply collect the power which Nature has provided and render it available.

The type of water wheel which we are now

Fig. 5.

going to talk about, and from which we can probably learn most, is that known as the breast wheel. The water is brought to this wheel by an open channel or 'head race,' which is at a level just below the top of the wheel, and it falls therefrom into what are called 'buckets' on the near side of the wheel (fig. 6). Its weight causes the wheel to rotate until, as each bucket approaches the lowest point in the revolution, the water pours out into the 'tail race.' The work which one pound of water does is obviously equal to one pound multiplied by the vertical distance in feet between the point where the water enters the bucket and that where it pours out, and this is always less than the total difference of level between the head and tail races, as we have to leave a margin at the top to allow the water to fall into the buckets, and at the bottom to prevent the tail race flooding and stopping the wheel. All the work is done by the actual weight of the falling water.

The power which is developed can be roughly determined fairly easily, for we can measure how much water each bucket will hold and find its weight, which we will call w, then measure the height between intake and outfall in feet (h), and count how many buckets are filled in one minute (n) when the wheel is running

The work done by the water in each bucket = wh foot pounds.

The work done by the water in one minute = whn foot pounds, and so the horse power of the wheel

 $=\frac{whn}{33,000}$

We have not troubled about the various reasons which introduce small errors into this calculation. In a simple way it is near enough to be true.

(Continued on page 35.)

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. Farmer.

(Continued from page 3.)

CHAPTER II.
THE BLOOD PROMISE.

ULU walked, very softly, on the tips of her I toes. When hunting, she had learnt to be careful lest the least noise should scare her quarry, and the habit had become second nature. No cat could tread more lightly. Past group after group she drifted, until she reached the largest fire, around which were seated the elders of the tribe, a little apart from the huddle of huts, as suited their dignity. Here they were undisturbed by the stir of the settlement at evening, or by riotous children. Wise mothers did not let their young stray after sunset-there might be a wolf, or even a sabretoothed tiger, at the forest edge on the lookout for a fat morsel. And, usually, the children of the tribe were fat, for the tribal hunting-grounds abounded in game. Thanks to Zend, all other tribes had been kept successfully at a distance; all intruders had come to a sudden end. Of Zip-Zip's clan not one had survived but herself. She had only escaped because, alone, she was harmless. Bobo had asked if he might keep her, since, with a little slave to bully, Dilda might be more amiable.

Once within hearing of the group of elders, Lulu squatted down upon her heels, her hands clasped round her knees. Already she had caught Zend's name. Since she had passed the chief's hut that afternoon she had been vaguely uneasy, though she set small store by Ullah's judgment. Lulu despised Ullah, who lost her head easily, and took refuge on most occasions behind Zend, instead of fighting at his side as a chief's wife should do, in Lulu's opinion. And Ullah was always sure the worst would happen. Very likely there was not much wrong with Zend; the elders would know. They had seen so many things; they had so much experience to guide them. Experience Lulu respected. She knew its worth. dismay, the elders were not reassuring. To her

'I think that in the morning there will be no Zend,' said the eldest of all. He was just not too old to be useful. In a little while his memory would fail him, and then the tribe would probably decide he was not worth keeping. He would still need food, and would not be able to procure it for himself, or make any

return if it were provided for him. His head waggled as he talked already, his hands shook. But his voice could still carry as far as Lulu.

'There will be no Zend,' he repeated; 'and Zan is too young to succeed him. It is a pity, for some day he may be like his father. And Zend has been a good chief: I have never known a wiser nor a juster.'

'And Churruk will certainly kill the child,' said the next oldest. 'That also is a pity; but children grow quickly. It would not be long

before Zan might be a rival.'

'Churruk will kill him, and Churruk will be the next chief,' the eldest elder agreed. 'After Zend, he is the strongest of us all, and the most determined; but he will not be as good. There

are harder times before us.'

'Churruk will be bad. Bad!' said Lulu to herself, vehemently. She would have preferred any chief to Churruk; there was something about him she could not endure. In addition, Brild admired him greatly, and would slink after Churruk as a smaller beast of prey will slink after a larger for its leavings. Brild would help to kill a bird or animal that Churruk had wounded. Very likely he would offer to help to kill Zan; only Zan was so little still that Churruk would need no assistance. And, as Lulu thought of Zan, she remembered the last occasion on which she had seen Zend with the child. Zend had been kneeling by his son, guiding Zan's hands on a tiny bow.

'See how well he aims already,' Zend had called proudly to Ullah. 'He will shoot far better than I can some day.' And, at that, he had caught up the child and put him on a tree bough, far above the ground. And Zan had hopped from leg to leg and laughed, not the

least afraid that he might fall.

What would Zend say if he knew of the fate in store for Zan? Lulu wondered. A moment she sat, motionless; then she began to edge away towards the chief's hut, impelled by an impulse she could not explain. She was on Zend's side. That was all that was clear to her, but she would have preferred to avoid him at the moment. She did not like ill people; they seemed in touch with a world of which she was suspicious. But still she drew nearer and nearer, until she could see Ullah busy with

her pot again, while Zan played on the far side of the fire. Zend must be alone; Lulu hesitated. Ullah's back was towards the hut door. Lulu glanced at her once more, and then, surprisingly, she found herself inside the hut. She stood, motionless, close to the doorway.

The sun had set, and, through the hole in the roof, came only a glimmer of daylight. At the far end of the hut lay something dark that must be Zend. Zend was fidgeting and muttering, and Lulu stiffened a little and pressed back against the wall. To whom was Zend talking? It must be to something she could not see.

'Zan!' said Zend, clearly. 'Zan!' And, at that, Lulu ventured a little nearer. Zend was only talking to himself apparently, not to an invisible presence. So close she crept that, finally, she could see his face almost plainly, whitish in the uncertain light.

He was not altered much from the Zend of yesterday. His eyes looked a little sunken, his nose a little pinched. But that was all. Lulu felt better. Zend would be strong again very soon, she told herself. The elders had made sure too quickly the chief's place was almost empty. As she thought of Churruk's rage and disappointment, Lulu chuckled, and, at the sound, Zend turned his head towards her. To her relief, he smiled.

(Continued on page 18.)

WHEN MAN WAS YOUNG.

HAVE you ever watched a street in a big you have been looking at the real romance of mankind. You will see layer after layer of wood, asphalt, concrete, rubble, earth: pipes running you do not know whence or whither, holes and maybe hooks or pegs for men to climb ten or twenty feet beneath where you are standing, and wander about unseen in the great tubes that carry our drainage or our In the end, if you dig far water supply. enough, you would come to some sort of rock.

That is a summary of man's history. The strange tale of how our forefathers slowly, very very slowly, grew up themselves, and built this civilisation in which we live to-day, is simply a story of layer upon layer. What is more, it is 'written' for us, not in books, but in just that kind of earth-formation of which a hole in a street shows us a small model. But many of the words in that strange 'writing' are not yet

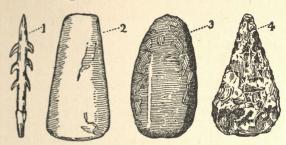
clear, and may never be clear.

Geologists, people who study the way in which both the surface and the inside of the earth have changed during millions of years, have found various ways of discovering how long it might have taken to build a particular layer (or 'formation'): for instance, by seeing how soon a hard object laid upon the ground is buried by wind-borne or rain-swept dust; how quickly the sea eats away rocks, how long it takes dripping water in a cavern to build a stalactite (an icicle-like thing hanging from the roof), or at what pace a river 'silts' up and builds new land. They have grouped all this information into immense periods of time, with learned names which need not be given here. And in some of those periods they have found evidence of the life of mankind-things buried many layers deep, bones, carvings, tools, skulls, all showing that man existed infinitely long ago, when the earth looked very unlike its present self-as its present self may look different thousands of

years hence.

They have decided, though many points remain to be cleared up, that our oldest ancestors were alive at the time when mammoths and sabre-toothed tigers and cave bears (the more terrible forerunners of our own elephants and tigers and bears—see p. 29) were still in existence. Man made weapons against them -rough stone axes and hammers, which he could bind with fibre to a deer-horn or a wooden shaft. He killed and ate them, though very likely he was often killed and eaten himself. It is not known how or when he invented fire: probably either by friction (rubbing sticks together) or by striking sparks from flint. For clothes he wore the skins of the eaten beasts. He lived in caves, when he could find them, but quite early in his career, most likely, he made huts of reeds and wood and mud. We do not know his language. It was probably at first nothing much more than signs and imitative noises; for instance, we say 'puss' because it is a little like a cat's hiss, and 'bow-wow' for the dog's bark in the same way. Writing was a very much later invention.

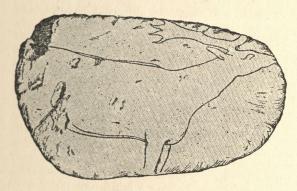
He soon learnt to make pots out of claythough not with a potter's wheel, for a very long time. His skill in making stone implements grew, and we can trace the changes in it and its approach to perfection, as the illustrations show. Eventually, also, he learnt to

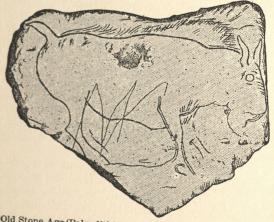


1. A Bone Harpoon, found in France (Old Stone Age); 2 and 3. Stone Age Axe-heads; 4. The first Stone Age weapon ever found and recognised as such; discovered in Gray's Inn Lane, London. All in the British Museum.



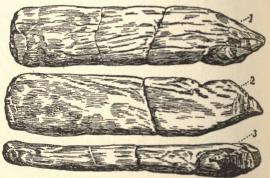
Old Stone Age Carvings on an Antier. Found in France. In the British Museum.





Old Stone Age (Palæolithic) pebbles, engraved with figures of animals. In the British Museum. Found in France.

weave fibre into something like linen. But in all these countless early centuries he never discovered how to extract metal from the metal-bearing rocks. He had little time for thinking about inventions; life amid wild beasts, life that depended on what you could yourself catch and eat, was too difficult for much thought. You lived from hand to mouth, and



A Bone Implement found at Piltdown, Sussex; very early Stone Age. It is made of elephant bone; three views of it, about one-seventh the actual size. In the Natural History Museum, South Kensington.

took your chances: a good chance and a quick mind meant a step forward for all mankind.

Yet his forefathers made wonderful things. Look at the girl's head on page 16—carved out of the tusk of a mammoth, a beast extinct long before history was ever written (that is what



Left—A New Stone Age (Neolithic) Pottery Bowl (black), found in the Thames at Mortlake. In the British Right. Two views at Mortlake.

Right—Two views of a girl's head, carved in mammoth ivory. Found in France. In the Musée S. Germain. After a photograph by Pairault.

'prehistoric' means). Look at the drawings and carvings of animals on bone or horn. No animal ever did that kind of work: only man could achieve it. Look at the highly polished, beautifully shaped celts (axe-heads), and see how they must have developed from the much rougher one which was the first to be discovered (see above) and recognised for what it was.

(Concluded on page 22.)



" will save Zan,' Lulu cried."

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c. Illustrated by E. S. FARMER.

(Continued from page 15.)

ULU!' said Zend. 'You were always inquisitive. Why have you come? To

see what I looked like?'

'No,' Lulu answered, smiling too. This was the Zend who had always teased her, but had often helped her to gratify her curiosity. She would tell him of the elders' mistake; they would laugh at it together. She would tell him, too, what Churruk had planned, that the latter might be duly punished. Very likely Zend would force Churruk to leave the tribe and fend for himself as best he could. There were such outcasts, Lulu had heard of them; they were as friendless as the wild beasts.

'Zend,' said Lulu, 'the elders are talking nonsense. They are saying that soon you will not be here, and Churruk will reign in your place.' She chuckled again, but the chuckle died away as Zend's expression changed, and he

looked at her fixedly.

'It is not nonsense; it is the truth,' he said. 'Even now I can hardly lift my hand. I am very cold from my neck downwards, though there are many skins heaped over me. And Churruk will rule, for who could dispute the headship with him? But what more did they say? What more?' Zend questioned, urgently. 'Did they speak of Zan?'

'Yes,' Lulu admitted, reluctantly. She was no longer eager to tell Zend all that she had heard. Nor did she want to watch him unhappy. Once outside, she could forget. She was edging towards the hut doorway when Zend's entreating eyes drew her close once more.

'Churruk will kill Zan?' Zend questioned, and set his teeth in his lower lip so that it bled.

'Yes,' Lulu admitted again.

Frowning, a trifle sullen, she watched the trickle of blood run down Zend's chin. Then, all at once, she crept still nearer and bent over him. 'I will save Zan,' Lulu cried. She caught a drop of Zend's blood on her finger-tip

'By this blood I promise,' said Lulu. It was the most solemn vow she could take.

CHAPTER III.

WHAT COMES NEXT?

Lulu was both thoughtful and a little scared as she returned to Bobo's hut. So binding was

the promise she had given, in her opinion she would suffer awful penalties did she fail to keep it; that unknown forces were now leagued against her. She glanced apprehensively at the shadows, but, a moment later, felt more confident. Was she not usually successful in everything she undertook? She and Zip-Zip together would plan the rescue of Zan. To ask for Bobo's help was useless. He was not interested in the child, and did not mind who ruled the tribe if he were left in peace to carve, And his pictures were so much appreciated, his fellow-tribesmen would often give him meat in return, an additional advantage. He was still carving the bear's tooth contentedly. Lulu watched him for a moment, then turned to look for Zip-Zip, who was curled up on the other side of the fire, fast asleep, her tasks done for the present. Zip-Zip could sleep at any moment, and wake as quickly. She raised her head instantly at Lulu's whisper.

'Zip-Zip, I want to talk to you,' Lulu told her; and Zip-Zip blinked once or twice and was wide awake. Immediately she pointed to the tree where the salmon hung, temporarily forgotten by Lulu. Up the trunk Brild was swarming, unaware that his cousin had returned. Across the intervening space Lulu darted noiselessly, seized Brild by the leg and pulled him down. Then she caught hold of his head and bumped it against the tree-trunk

before he could escape.

'Hyena!' said Lulu, scornfully. She could think of no worse name. 'Eater of carrion!'

'Carrion?' howled Brild. He was larger than Lulu, but rarely stood up to her, and at the moment he was completely worsted. He had landed on the ground with a thud that had knocked the breath out of him, and now his head felt twice as big as usual. 'You are a carrion-eater too, then,' he yelled. 'You are going to eat that salmon.'

'It is my kill,' Lulu reminded him, haughtily.

'A kill is not carrion.'

Refreshed by the little encounter, she returned to Zip-Zip, who had been watching admiringly. 'Where is Dilda?' Lulu ques-

'Over there; talking to Ullah,' Zip-Zip answered, pointing; and Lulu drewher a little apart till neither Brild nor Bobo could overhear.

'Zip-Zip,' she began, 'I have vowed a vow.

I have sealed it with blood.'

'Ow-wow!' breathed Zip-Zip, excited. Sometimes, when deeply moved, she would bark like a puppy. Her family had always signalled to each other by barking when separated in the forest, she had once told Lulu. 'I think it was because most things are afraid of wild dogs that hunt in packs,' Zip-Zip had reasoned, 'and so it was the safest signal we could make.'

'A blood promise,' Lulu went on, pleased with

the impression she was creating. Then she paused, as she noticed that Dilda was returning, and, at the same moment, Ullah disappeared inside Zend's hut.

(Continued on page 27.)

PUZZLE MONOGRAMS SOLUTIONS.

(See page 8.)

The solutions of the Monograms on page 8 of *Chatterbox* are as follows (left to right, across):—More objects in a Carpenter's Shop: (i) Spanner. (ii) Chisel. (iii) Hammer. (iv) Pincers.

UNDER WATER.

WHAT THE ZOO AQUARIUM CAN TELL YOU.

THE Gardens of the Zoological Society of London, on the public land of Regent's Park, contain the most wonderful collection of fishes and sea-creatures in the world. A fish, any fish, is at least as interesting as any fourfooted beast. But we do not get much chance to see a fish's home-circle, so to speak. I have bathed in the middle of a vast inrush of 'bait' (little silver things an inch or two long), driven in to shore by the huge shoals of sprats which chase them; and I have gone out to sea a little way to watch the thousands of mackerel pressing upon the tails of the sprats and eating as many as they pleased-and further out, to look at the porpoises leaping joyfully to catch the mackerel. Also, if you watch a deep pool in (say) Cornish rocks, you can often get a good sight of the bull-head in the red and green sea-weed, though he is both swift and shy. In an inland stream you can watch trout and eels and 'coarse' fish, though you must learn first a good deal about the way the water takes reflections and shadows, if you are not going to frighten the quick creatures into a shelter from which they will not come out until you have withdrawn. But there is practically no such way to get a 'closeup' of a fish's private life as the Zoo Aquarium affords.

This extraordinary institution is underneath one which is hardly less extraordinary—the Mappin Terraces, where bears and other wild beasts can roam about without any bars (only wide, deep trenches) to keep them from putting their teeth into visitors. The Aquarium holds big tanks very carefully heated to suit the habits of different fish. Some are filled with

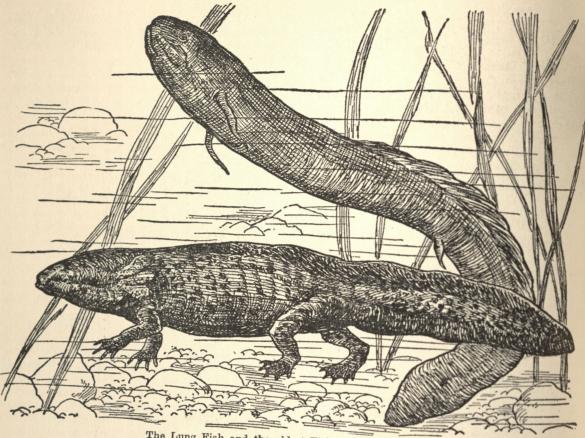
salt water, others with fresh, and each contains the weeds, rock, sand, and so on, to suit its inhabitants. It is *the* 'show' of the Zoo, until fresh wonders have been invented.

Perhaps the strangest fish of all is the Axolotl. The name is Mexican, and the creature lives in Mexican waters. The queer thing about it is that it is both a fish and an 'animal'—as it pleases. If it has a chance (according to the condition of its watery home), it uses its legs—or rather, loses its fins—and turns into the lizard-like land-creature known as a salamander. But if the water conditions are not suitable, it remains (apparently happy) a fish.

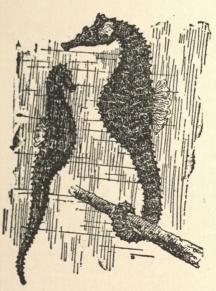
The Lung Fish, shown in the same picture as the Axolotl, also lives on land at times. He has a special breathing apparatus to enable him to do so. When the rivers run dry or become too dirty for a decent fish's comfort, in South America and the tropical countries he inhabits, he burrows into the sand and lays eggs and seems to go to sleep. The Australian variety can be seen coming up to the surface to take air into his lungs.

Sea-horses are perfectly jolly. They sail about upright, looking like chess-board knights, but not using the 'knight's move.' They come chiefly from the Mediterranean, and Mr. Boulenger, the Director of the Aquarium, tells us that they were brought to Regent's Park by aeroplane, a rare change. They can anchor themselves to weeds by their curly tails.

Many tales have been told about the Electric Eel, for which the wonderful River Amazon is a home. But not all the tales, by any means,



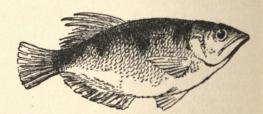
The Lung Fish and the oldest Fish-animal, the Axolotl.



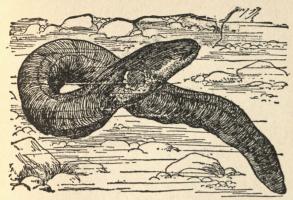
Sea Horses in Pride.

are true. However, it is true that this strange fish can give a quite painful 'electric shock' that is, contact with it reacts from its nerves upon those of people and animals who touch it.

Have you ever seen an Angel with a Pipe, or a fish that fires a rifle under water? They are all at Regent's Park. But the Archer or Rifleman fish uses water instead of powder and shot. It catches water insects by squirting at them, and it lives in the East Indies. A drawing of it is here given. Pipe fish, of course, are pipes, as you can see. They share a lodging in



The Angler Fish.



The Electric Eel.

the Aquarium with the sea horses, and like them cling on to weeds by their thin tails, and sometimes it is hard to say which is the weed and which is the fish. The Angels are very upright, and their fins are almost like wings. They are beautifully and strangely marked.

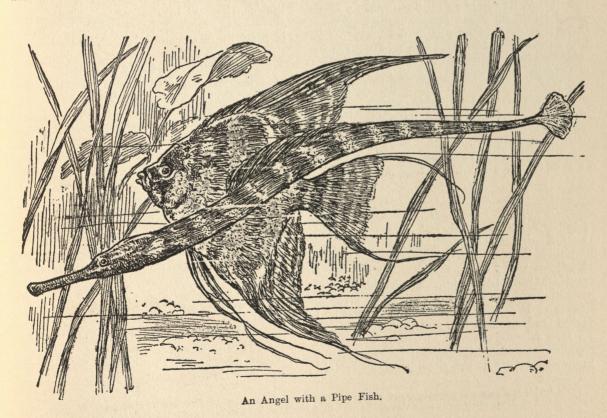
If you know anything about hermits, you will understand how the Hermit Crab got his

name. He is very soft-bodied (unlike the ordinary crab—but he has claws too), and so has to put on armour, and this armour he takes for his house. He often fights for this house—an empty whelk-shell as a rule—and if another and stronger house-hunter comes along



A Hermit Crab's housing Problem.

he may be killed and eaten. Hermits are curious things to watch, as they lumber along like armoured cars or tanks, or writhe into the depths of a new castle and get ready to defend



it. They grow quickly, and often have to find a fresh house. Fortunately they are pretty well armed with pointed legs and claws. If you meet one on the shore (and if you do meet one you will probably meet several watch it well and do not frighten it, for it an uncanny and fascinating thing.

(Concluded on page 31.)

WHEN MAN WAS YOUNG.

(Concluded from page 16.)

WE do not know these things about early man only from the formations of the earth and what is found in them; though those formations are the best guide to real age, because no one to-day would trouble to make a stone axe by hand (and there are various ways of proof that the axes were made by hand) and bury it thirty or forty yards deep, just to be able to invent untruthful history: but 'prehistory' goes many fathoms deeper than thirty feet. We know, because the Stone Ages—as they are called-lasted into our own times, in remote, untouched countries, where races of men had never come into contact with other and more advanced races: in Australia, for instance, and among African tribes which have only died out in our own lifetime. Men have been found living in conditions such as those our forefathers must have endured perhaps three hundred and fifty thousand years before Christ*—using stone weapons, making fire by rubbing sticks, using a language more like a mixture of clicks and grunts than plain words. Mankind has been like those layers of the earth's structure. In some places, the orderly layers are forced up (a 'fault,' it is called in geology) or broken apart and twisted, and a little piece of one formation is left all alone out of its place. Volcanoes, or earthquakes, or floods after the earth's face, and cut one

tiny race or family off from its kindred, just as they cut out the rocks from their proper order. The fragment lives on alone, and has not the benefit of seeing what improvements other men make or have made; and unless it has some special genius of its own, it remains in the dark savagery in which it was when it was cut off. But that, too, adds to the knowledge which we who happily have not been cut off can obtain of what once we were like.

We call these immense periods of man's lifetime on earth by various names. But the best are the simplest: Eolithic—Stone Age Man of Mankind's Dawn, the very earliest man known to us by discoveries: Palæolithic—Old Stone Age; that is, not the first, but very, very old: Neolithic—New Stone Age; that is, the end of the use of stone only, the 'youngest' stone age, just before man discovered in turn, bronze, iron and steel, and made from them strange and better tools and weapons.

So that is the real world in which the people of The Dim Red Dawn lived: our true forefathers, dirty, fierce, hard put to it for a living, but very wonderful all the same, and all the more wonderful as every year we pick up little grains of knowledge about them.

The illustrations are drawn from the objects themselves, in the Museums named under each, by leave of the authorities. D.

PEGGY'S VISITOR.

PEGGY had been ill, not just staying in bed with a cold, with toys to play with and nice things to eat and Mother to read aloud, but really ill, so that she did not know much what was happening, except that she was very miserable and uncomfortable. A strange nurse in a white cap came to help Mother and Nannie to look after her, and Mother's grown-up lady friends rang up on the telephone to ask how she was. Of course, Peggy did not know about that at the time, but Hubert told

her about it, and he said Doris, the parlourmaid, was kept quite busy running to answer it.

Hubert was Peggy's brother, and he was six years old. Peggy herself was nearly eight, and then there was Michael, who was four, and Baby Joan, who was almost two.

She was nearly well now. The strange nurse had gone, and she was able to come down to dinner on Christmas Day and enjoy all the games and fun and all her presents. But now Mother said she was afraid she

^{*} This is a date given conjecturally by the greatest authority, Sir Arthur Keith, in *The Antiquity of Man.*Many other dates are suggested by scientists, some further back, some nearer. No one knows.

could not let her go to Aunt Agatha's party,

and it was a great disappointment.

'Never mind, Peggy,' said Uncle George, who was spending Christmas with them, as he usually did, 'I daresay they will give you some nice cakes for tea at home.'

'As if I minded about the cakes!' Peggy was quite indignant. 'I am not so greedy as that, but I did want to go to the party, and specially to see Father Christmas. He came last year, and it was so lovely, don't you remember?'

'No, I did not see him,' answered Uncle George, 'I had to go away early, and he came

after I left.'

'Oh, yes, I remember. Never mind, perhaps you'll see him this year. Aunt Agatha said she would ask him again, but of course she did not know if he would be able to come. Uncle George, continued Peggy, a little anxiously, 'If Father Christmas has a present for me and I am not there, what do you think he will do with it? Hubert says perhaps he will give it to him to bring home. Do you think he would?'

'More likely to keep it till next year, if he is wise,' answered Uncle George. 'What do

you want him to bring you, Peggy? 'Oh, I don't know, all his things are so lovely, but I think,' slowly and consideringly, 'I think a baby doll. You see I have a pram, and Mother gave me a lovely cradle on Christmas Day, but I haven't a baby to put into it. Lucy is really too old,' displaying a somewhat worn doll with long hair; 'I put her on a white frock, and pretend she is a baby, but she doesn't look like one, does she?'

'No,' responded Uncle George, 'she looks a bit elderly. You should bob her hair, Peggy;

that would make her look more like it.'

'Oh, no, I could not do that. I might want her to be a girl again; besides, I do so love brushing and combing it,' and Peggy proceeded to do so for the fourth or fifth time that afternoon.

The afternoon of the party came, and the others all went off. Nurse went as well as Mother, so that she could look after Baby Joan, and Doris was to look after Peggy.

This Peggy did not mind at all, for Doris was very nice and amusing and could play

lovely games.

This afternoon she had tea with Peggy in the nursery, and there were some beautiful cakes, little ones with pink sugar or chocolate

icing on them, and there were potted meat sandwiches too, and actually some crackers. They had great fun with them, and Doris put a paper cap on the top of her own white one, which made Peggy laugh so she could hardly drink her tea.

When they had finished, Doris cleared the table and carried the tray downstairs; she said she would not be long, as Cook has promised to wash up, so that she could have more time for games.

Peggy was just considering what they should play at, when the door opened and a voice

said, 'Hullo, Peggy!'

She looked up, thinking it was Uncle George, who ought to be at the party, and there stood Father Christmas himself, looking just as he did last year, in a long red gown and hood, with a wreath of holly and such a big white beard you could scarcely see anything of his face. He was carrying a bumpy sack, which he opened, saying in a deep, gruff voice:

'I heard you had been ill, and could not go to the party, so I thought I would just look in on my way and give you the presents I had

got for you.'

He produced a box of chocolates, then three crackers tied togetherw ith a piece of ribbon, and a dear little pincushion that looked like a strawberry, and, lastly, a lovely baby doll!

Peggy was so pleased she could hardly speak, she just gasped out, 'How lovely! thank you so much,' and then Doris came in saying:

'The car is at the door, Sir.'

Mumbling something about his reindeer being so tired after Christmas Eve that he had to use a car, Father Christmas picked up his sack and hurried out of the room, turning round at the door to say:

'Good-bye, Peggy. Don't get ill next year.' 'Good-bye, Father Christmas,' said Peggy.
'Thank you again ever so much. It was kind

of you to come.'

Doris went after him, but soon came back and helped Peggy to examine and admire her presents. The baby doll was a beauty, dressed just like a real baby, with a bonnet and cloak, and all its clothes would take off and on.

Doris helped her to undress it, and they pretended to give it a bath in the waste-paper basket, and then put it to bed in the cradle. Then they dressed it again and took it for a walk round the nursery in the pram, and Peggy was so happy, and enjoyed herself so much, she never noticed how the time went,

and was quite surprised when the others came back eager to show her their presents. Hubert had a toy gun and a pencil, Michael had a horse and cart and a balloon, and Baby Joan had a soft rabbit and a ball, and all had crackers and sweets.

'Father Christmas came again himself,' said Hubert, 'but he didn't give me anything for

you, Peggy.'

'No,' answered Peggy, as she proudly showed her treasures; 'he came and gave them to me his own self,' and she told them about her visitor.

When everything had been admired, and she had seen Mother's bag and Nannie's thimble, Peggy asked, 'And what did Uncle George have? I hope Father Christmas gave him something very nice.'

'No, he didn't, answered Hubert, 'because Uncle George was very late, and when he got there, Father Christmas had been and gone.

'Oh, poor Uncle George,' said Peggy, running to meet him as he came into the room and giving him a hug. 'You always miss Father Christmas.'

Uncle George gave her a kiss. 'Yes, I've no luck,' he said. 'I must try and manage better next year.' MARION FORD.

OUR DIAMOND JUBILEE.

EVERY one has heard of Chatterbox, apart from those who read these words. It may seem terrible to Chatterbox readers to be sixty years old; but Chatterbox is rather proud of being so old-and keeping so young.

Think of it. The present Editor took over his job a quarter of a century ago-before King Edward VII. was King, before King George V. was King. He has had only one predecessor, the late Canon Erskine Clarke; and Canon Clarke began his work on Chatterbox when Queen Victoria had reigned less than half her period, and was only forty-seven years old. Chatterbox has lived as long (and, the Editor hopes, as honourably) as Queen Victoria reigned. It is older than King George or the present Prime Minister, Mr. Baldwin. But in spirit and goodwill it is as young as when it

We are going to include in this Diamond Jubilee volume of Chatterbox, from time to time, some notes on the magazine's history, and a few extracts from what appeared in its These will, the Editor of

Chatterbox hopes, prove its long memory and its freshness, as well as its close touch with traditions which deserve to be kept alive.

FROM CHATTERBOX OF SIXTY YEARS AGO.

L-PITCH IN BOOTS.

HAVE heard of a company of hunters who caught a number of monkeys in the forests in

Brazil in the following way.

They had a lot of little boots made, just big enough to be drawn easily over a monkey's foot, and filled the bottom with pitch. With these they set out for the woods, and soon found themselves under the trees, where the lively little fellows were leaping about among the branches, hanging by their tails, swinging themselves from one tree to another. and chattering noisily together, as if making their remarks on the strange visitors that had come into their quarters. The hunters were too wise to try and capture them by climbing the trees; they might as well have expected to catch a flying bird as to lay hands upon one of these nimble creatures,

They had an easier way than climbing, and one much more effectual; they simply sat down under the trees while the little chatterers were rattling on over their heads, never for a moment taking their eyes off the hunters. Then the hunters placed the little boots where the monkeys could see them, and then began taking off their own boots. Having done this, they let them stand awhile near the little boots. All this the monkeys very carefully noticed. The hunters, now taking up their own boots, and having carefully looked over them, drew them slowly one after the other upon their feet.

Not a motion escaped the observation of the monkeys. Having replaced their boots, the cunning hunters hurried away to a thicket of undergrowth not far off, where they were hidden from the sight of the monkeys, but where they could see everything that happened under the trees. They left the small boots all standing in a row.

They were no sooner out of sight than down from the trees dropped the monkeys. They looked at the boots, took them up, smelt them, and at last, seating themselves as the hunters had done, they

drew them on over their feet.

As soon as they were fairly in the boots, out sprang the hunters from their hiding-place, and rushed among them. The monkeys, affrighted, at once started for the trees, but only to find that they had destroyed their power of climbing by putting on the boots. So they fell an easy prey to their cunning enemies.

This is the way the monkeys were caught, and how many young persons are caught in the same way by desiring to do what they see other persons

doing!



"Why!' exclaimed Babs, 'it's our own river, I do declare!'"

LOST ON THE MOORS.

BABS and I have been staying on our Uncle's farm on the moors for nearly We always come here in the three weeks. summer holidays, and we always have a

splendid time.

It is a big farm with lots of horses and cows and sheep and ducks and dogs; there is a big pond, and the river that crosses this part of the moors runs through a corner of the grounds. We are allowed to bathe in the river, and there is an old horse Uncle lets us ride, so what with helping in the dairy and the garden, going out with the shepherd, driving with Uncle into market, picnics, bathes, and long exploring walks, we find the time pass very quickly.

These three weeks the weather has been real summer weather, and we have been in the river every day and had three big picnics and

several little ones.

On one of the big picnics, when we were a good many miles from home, we noticed on a distant tor, or hill, some big slabs of rock that looked like the ruins of something. Uncle said they were ruins, and perhaps had been

part of a very ancient heathen temple.

Babs and I begged for us all to go on there for the picnic, but Uncle said there was no time that day, though he would try and manage it some time. Babs and I simply ached to get close up to those big grey stones; they looked as if some of them had fallen together and made a sort of little house, and we felt what a perfect place it would be for adventures.

Well, we couldn't do anything about it that day, but on the way home we had a talk, and we decided to go for one of our long walks the very next day, getting Auntie to give us our meals for the day, and to find our way to Stone

Tor rocks, as they were called.

We were so excited about this plan that we could hardly go to sleep that night. decided not to tell Uncle or Auntie where we meant to go, in case they said it was too far or that we must not go alone. So we just said we wanted enough to eat for dinner and tea, and as we often went off like that, they did not ask any questions.

It is very strange how one day will seem to be going to be just like any other, and that nothing tells you you are going to have wonderful adventures or real serious things happening to you. That day seemed no different, and

neither Babs nor I guessed that before we we home again we were going to have the adven ture of our lives and really be in danger, and have to use our wits to come out of it safely,

We started off soon after breakfast, each with a satchel on our shoulders. It was already hot; the moors were levely with purple heather and our path was just a little twisty track winding in and out and taking us deeper and deeper into the heart of the moorland. We knew the way as far as where we had been the day before, but after that it was all new.

We sat in the shade of a big, lichened stone to eat our dinner, on the little tor from where we could see Stone Tor in the distance. Pasties and lemon tartlets and apples and milk. It was good! and we were glad to have our satchels so much lighter. As we looked across we could see the gleam of a river sparkling here and there; it seemed to come from behind Stone Tor and run toward the direction we had come from.

'Why!' exclaimed Babs, 'it's our own river, I do believe, that runs through the farm. How

It was when we had eaten our dinner and were halfway between the little tor and Stone Tor that things began to happen. Quite suddenly we noticed the sunshine fading, and almost before we could realise it a dense white mist had rolled up and surrounded us.

'I say!' said Babs. We both stopped walk-

ing and stood close to one another.

These moorland fogs often last for hours,' I said. 'We must try to get back, or we shall

be here all night.'

In heavy billows that thickened and thinned and thickened again the mists swept round us. We took a few steps and in a minute had lost the path. We tried again, holding hands, in case the mist should come between us; and then we moved on together slowly.

(Concluded on page 47.)

THE 'PALINDROME.'

THE 'palindrome' is a line that reads alike backward and forward. For instance, this - 'Madam, I'm Adam!

Another is given in the story that Napoleon, when at St. Helena, being asked by an Englishman if he could have sacked London, replied: 'Able was I ere I saw Elba.' This is the best palindrome, probably, in the language.

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. Farmer.

(Continued from page 19.)

HARDLY had Ullah vanished than scream upon scream came through the curtained doorway. Out of the hut flew Ullah again, still shrieking, Zan in her arms. Zan was screaming too, but with anger, as he tried to struggle free. It always enraged him to be treated as a baby, and he had refused to be carried since first he could walk. But Ullah, who generally gave way to him on every occasion, now only clasped him tighter, while her screams grew more piercing. Men and women from the surrounding huts crowded about her, and Lulu and Zip-Zip made haste to add themselves to the tumult.

'Zend has gone! Zend has gone!' They could hear now what Ullah was crying. And the cry was taken up by those nearest.

'Zend has gone! Zend has gone!'
Lulu and Zip-Zip were screaming, too, as
Churruk came thrusting by, big and blustering, and caught the wailing Ullah by the

shoulder.
'Silence!' he ordered. 'Send for the elders,'
he shouted; 'let them look and judge.'

Already the elders were approaching, and the onlookers hushed their clamour as the old men and women passed into the hut. There was a low mutter of talk, then out they came again, and the oldest of all, facing the crowd, raised his hand.

'Zend lies quite still,' he announced. 'He is stiffening already; he is cold. Zend will not move of himself again. Those who have a share in what comes next must now do their reat.'

what does come next?' Lulu wondered. No chief had died in her lifetime. She was vaguely aware that on such occasions a certain ritual was observed, but she had not been sufficiently interested hitherto to ask of what it consisted. Was Zan in immediate danger? That at least she must ascertain. Followed by Zip-Zip she ran back to Bobo. He had just glanced in Ullah's direction when first she shrieked, and then he had begun to work again

'Uncle,' Lulu questioned: 'you heard? Zend can give no more orders. What will happen now? Is there a new chief already,

and can he do anything he likes? Quick, tell me.'

In so great a hurry she was that she almost snatched the tool from Bobo's hand, but restrained herself in time. Bobo would be furious if his carving were spoilt, and would certainly refuse to answer any questions, to punish her. As it was, he was glaring at her because she had jogged his elbow, and Lulu had to wait, fuming, until Bobo had deepened to his liking a cut that was too shallow.

'Get out of my light, I cannot see,' he growled; but, at last, was content.

'No, Zend still has power,' he answered then. 'His spirit has not left us yet. It has nothing to take on its long journey. It must wait until everything is ready.' He scratched at the bear's tooth again, and put his head on one side to consider the effect.

'Yes?' Lulu urged, deeply interested. She had forgotten Zan for the moment as she pictured Zend's waiting spirit.

'A hole will be dug in the ground for Zend's body,' Bobo explained. 'A deep hole, so that the wild things that feed on dead bodies cannot reach him. And Zend will be laid in the hole, dressed in the best of his skins, and by his side will be food and water, and his weapons, so that his spirit may be neither cold nor hungry, thirsty nor defenceless. If it were not treated with proper respect, it would grow angry, and harm us all. And the earth will be put back into the hole and piled high, that all may know where Zend lies, and no one, by mistake, disturb him. And, after that, a new chief will reign, and all that was Zend's will be his.'

'All but Zan,' said Lulu firmly, to herself.
'He won't get Zan, for Zan will have gone.
How long will it be before the earth is put back?' she asked Bobo. He had just finished a troublesome curve, and so was able to lay down his tool for a moment while he counted on his fingers.

'Not to-morrow, nor the next day, but at sunrise on the day following,' Bobo reckoned. 'That is the custom. On the third day the spirit is always in a hurry to depart. Now I have had enough of you, Lulu. Begone.'



66 'Zend has gone! Zend has gone!' Ullah was crying."



The Mammoth: the Elephant's Grandfather.

There is a fine model of one at the Natural History Museum, South Kensington. One was dug out, fur and all, almost perfect, completely frozen, in Siberia some years ago, and there is no guess-work about this, though the discovery proved what scientists had already guessed accurately. (See page 15.)



The Sabre-Toothed Tiger: Man in England had to fight him with stone axes. Man won. There is a model in the Natural History Museum.



A real Prehistoric Boat—a "dug-out" or canoe made of a tree-trunk. In the London Museum.

Something of "The Dim Red Dawn" which can still be seen.

'I've plenty of time,' Lulu reckoned, relieved, as she obeyed. 'Plenty.'

She nodded and smiled meaningly at Zip-Zip, who was puzzled, but who tried to look as intelligent as possible.

'To-morrow!' Lulu whispered, a finger on her lips. 'To-morrow we will make our plans.'

'To-morrow!' Zip-Zip whispered back, still mystified, but eager to do anything required of her.

(Continued on page 39.)

MISS MUFFET'S MISTAKE.

IT doubtless did not occur to Miss Muffet that the spider which sat down beside her was a creature at which it was worth looking carefully. But really that is what she ought to have done, and what every one should do when they get the chance. There are very few better sujects for a nature study than a spider hanging in the middle of its web.

The spider's web itself is remarkable because it is almost the only trap that any animal makes in order to catch another, and it is indeed extraordinary that, although spiders have evidently found the web a very successful invention, no other order of animals seems to

have hit upon the same idea.

The web tells the spider so much. Try shaking ever so gently a distant part of the web with a long grass stem. Instantly the spider wakes up, and by the feel of the threads can tell exactly where the disturbance is. Most probably it will run along the threads to find out what the trouble is about, and if it does so,

you will notice that when it arrives it does

not look at the bit of grass, but feels it with

outstretched legs.

The spines and strong hairs on the spider's legs are the organs it feels with, like our finger-tips. They are wonderfully delicate, and the spider makes so much use of its sense of touch that it scarcely wants any eyes at all. On the top of its body, in front, there are eight small bead-like black eyes, but the spider would rather feel a thing than see it. It feels the arrival of a fly in its web, feels its way along the threads, and when it reaches the spot, feels what sort of a thing it has caught.

More than this, it feels sounds too. Stand in front of the web and give a hoarse cough or get the dog to bark, and the spider will jump, stretching out its forelegs towards you. A curious way to listen! If the same spider is on the ground, or on a leaf, it will take no notice of sounds at all. It is really all but deaf, and all it does is to feel its web quivering when the waves of sound strike it. That is not at all the way we hear, but the wonderful

thing is that although a sound wave can only make the web shake a very very little, yet the

spider is able to feel it.

And the silk of which the web is made is Watch a web the most marvellous stuff. swinging in the wind and see how far the threads stretch, without any risk of breaking. The silkworm and a few other creatures can make silk, but none uses it to anything like the same extent as does the spider.

The baby spider is born into a silk nursery. It leaves its home on a silk thread and builds itself a silk web. It binds up with silk ropes its struggling prey or its fierce enemies, lays its eggs on silk cushions in a silk cocoon, and sleeps through the cold of winter in a silk bed.

Few people think of the spider as a creature of much interest, but it can in truth provide far more entertainment than many more popular THEODORE SAVORY.

beasties.

ASSISTANT. A FUNNY SHOP

WHAT a tiny shop! Simply crammed full of things! There isn't room to move! exclaimed May Preston, as she stopped to look in at the door of the one shop in the village where she and her family were spending their holidays. 'Look, children,' cried she to her brothers and sisters.

Immediately May was surrounded by a cluster of boys and girls eager to get a sight of

'What d'you want?' cried a strange voice

from the dim shadows of the shop.

The children craned their necks to see who the speaker might be, but there seemed to be no room for anybody among the biscuit-tins, baskets, brooms, flour-barrels, and crockery which crowded the floor space. There was barely room for a customer at the narrow counter. Overhead, hung garments of every description for man, woman, or child.

'Wa-al,' drawled the speaker, and then

broke into a soft cackling laugh.

'Where does the voice come from, I should like to know?' said Joe, pushing his way a little further into the narrow space.

'Mother, you're wanted!' shrieked the invisible person, and again there was a peal of

laughter.

'I say! A lunatic somewhere!' muttered Joe, exploring behind the shirts, coats, and other garments which hung on the line.

'Let's go home, May! I don't like this shop,'

whimpered little Agnes.

'Nonsense! Don't be a baby!' was all the

comfort she got from her elder sister.
'Whew! You'll never guess who's speaking! A penny for the one who guesses right,' cried Joe, producing a few pence from his pocket in a lordly manner.

'Come along, Mother!' said this unseen person.

'A green parrot! Well, I declare!' exclaimed May, pushing back some material which hid the cage from view.

There from the low ceiling, surrounded by shelves packed with all sorts of odd things, hung a large cage, in which sat a beautiful green parrot.

'You didn't guess, May! You looked! But I suppose I shall have to give you the penny,' said Joe, handing his sister a penny.

'Wa-al,' murmured the parrot softly. Then, at the top of his voice he screamed, 'Mother,

you're wanted.'

What a shriek!' exclaimed 'Gracious! Joe, whilst the other children laughed heartily.

Just then 'Mother' appeared through a glass door at the back of the shop, much surprised to find six children, two sitting on the narrow counter, a girl perched on a box labelled 'Quaker Oats,' with a small child on her knees; Joe and May alone had standing space.

'Come along, Mother!' chuckled the bird,

with his head on one side.

'We don't want to buy much; we came in because we've never seen such a tiny shopbegan May, hesitatingly.

You're welcome, my dears, and if you've nothing to spend to-day, may be you'll look in another time. Just walk round a bit.'

Walk round! They could hardly move! So they talked to the good woman instead.

'I should like a parrot like yours,' said Joe,

who loved all birds and animals.

'I dessay, sonny-but you won't find another bird like my "Beauty," answered the parrot's owner. 'I wouldn't part with you for all the gold in the world; you're companion, shopassistant, and the pride o' my heart, aren't you, my beauty?' said she, stroking her pet through the bars of his cage.

'Want a cup o' tea, Mother,' was the reply

that 'Beauty' made to this well-accustomed praise. How the children laughed at this speech and the antics which followed!

'Where did you get him?' asked May.

'Why, you'll be surprised, I know, my dears, when I tell you that he escaped out of a tramp steamer which was passing along this coast.'

'A tramp steamer? Oh, do tell us all about

it!' cried the children excitedly.

'I can't tell stories, but old Jim Brent down in the cove can tell you all about it if you ask him. Anyway, old Jim and his crew were out at sea hauling crab-pots, when a steamer passed them pretty close, and to their great surprise, a green parrot fluttered into their boat. They yelled to the crew of the steamer, but they were goin' full steam ahead, and took no notice, so Jim clutched "Beauty," as he called him, wrapped him up in his red pocket-handkerchief, and brought him ashore. I happened to be down in the cove, as it was early closing.

"Want to buy a parrot, Maria?" says Jim, giving me a peep o' the bird. Then he told

me how he came by him.

"You shall have ten shillings to-night if you'll find a cage to put it in, and another ten shillings next week if the parrot can talk," said I.

'Jim's eyes shone with delight. He was a poor man, with a peck of trouble at home.

"All right, Maria: you shall have the bird and the cage to-night," said Jim.

'Jim kept his word, and I kept mine. I'm as proud as a peacock of my treasure,' said old Maria, still fondling her Beauty.

'Let's go out in Jim's fishing-boat! Perhaps a parrot will fly on board again!' cried

little Agnes excitedly.

'Such things don't happen twice in a lifetime, child,' laughed old Maria, whilst Beauty

chuckled merrily.

'Let's go and tell Daddy and Mummy about this levely shop and Beauty. There's everything here that they can possibly want to buy,' said May, dragging the younger ones away from the crowded counter. 'We shall want to come every day, I know we shall,' added she.

'Bless your bonny faces! You'll be right welcome, won't they, Beauty?' said old

'Want a cup o' tea! Mother, you're wanted!' cried Beauty, ending with his usual

It was quite true; there were at least four customers waiting to do their day's shopping.

A few days later old Jim came to the shop with a pocketful of money to spend.

'Hullo, Jim! Things look flourishing,'

said Maria kindly.

'Yes! Thanks to you for telling all the children about "Beauty." I can buy a few comforts for the family.'

"Tis thanks to Beauty, not me, I reckon. He's a wonderful shop-assistant,' laughed

Maria.

Of course Beauty had to laugh and scream at the top of his voice. The children heard him from the end of the road, and hurried to laugh with the merry shop-assistant.

E. E. CARTER.

UNDER WATER.

WHAT THE ZOO AQUARIUM CAN TELL YOU. (Concluded from page 22.)

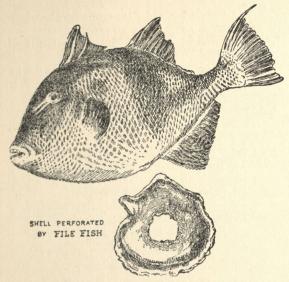
THE File Fish (sometimes called the Fool I Fish) is found in tropical waters. Though he can perforate a shell, as our illustration shows, he gets his name from his hard rough scales, which are harsh and prickly to the touch. Indeed, he is prickly all over, for his tail has sharpish spines, and the chief fin is often strong and spiky.

How much nicer is the tiny Paradise Fish, one of the gayest of all marine things, as bright as a picture from China-which is its home. It has fins huge in proportion to its body, and is radiantly coloured. It is often kept, like

goldfish, because of its beauty.

But no one really loves an octopus, which is the subject of more outlandish tales than even the electric eel. If you get a small octopus in a big fish-catch in a net or in a lobster-pot, you will see why. It is a repulsive thing, with its waving tentacles, all knobbed and frightening (they are really, so to speak, toes-suckers by which the creature anchors itself). It has a beak, and is strong enough to conquer shelled things like lobsters and crabs, and is amazingly clever in its movements and devices. It changes its colour like a chameleon, and can move backwards very fast by squirting water out from its gills-so getting a 'shove' back. It also can squirt a small cloud of 'ink'-a smoke-screen.

So much for the wonders of the deep. If you get a chance to see the waste of a Brixham trawler's catch—the fish that never get to the fishmonger's, and are not wanted there-have a good close look at the queer creatures that are in it: think why they have taken their odd

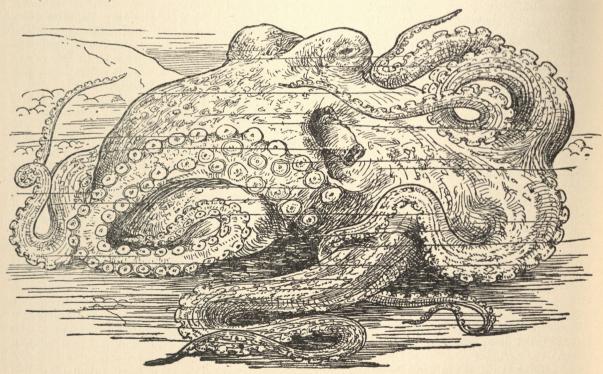


The File Fish and its work.

shapes and to what uses they put their strange features. And, if you get these other chances too, go to the Zoo Aquarium, and read Mr. E. G. Boulenger's fine book about it, *The Aquarium Book* (Duckworth).



Paradise Fish of China.



The Octopus.



•• • It's all your fault, you wicked girl."

WILLOW POND. THE

MISS ROSIE, can you look after Toddles and Baby while I go to the laundry?' asked Nurse one Saturday afternoon, coming to the hammock, where Rosie swung lazily on the lawn of her pretty home, 'The Cedars.' Her parents had gone to London for the week-end, and her governess was away for the day, as it was a half-

'Oh! I don't want to be bothered with them,' said Rosie. 'Why didn't you ask Robin to look after them, instead of letting him go off to

'How selfish you are! You've done nothing since dinner but lie there. It's not a boy's job to look after children, though I'm sure Master Robin would if he was here-he's so obliging.'

'Oh! I suppose I must see to them,' said Rosie,

ungraciously.

'Very well, mind you don't let Toddles out of your sight, or he will be off to Willow Pond,' said Nurse, as she went to fetch the children. She wheeled Baby's pram under the tree, and placed Toddles on a rug beside it, with a box of soldiers and his Teddy Bear, and then hurried off to the

village.

Toddles was only four-too young to amuse himself for long. Baby soon went to sleep, and the small boy asked his sister to take him into the hammock. Rosie did so, but a few minutes later, looking towards the gate, she saw her friend, Flossie Mayne, standing at it, and she said to the little boy, 'I must go and speak to Flossie, Toddles. Will you be very good and stay quietly in the hammock till I get back? I shan't be long.'

'Me come to gate too,' suggested Toddles.

'No, you must stay there. Mind you don't make a noise and wake Baby. Give Teddy Bear a swing-he will love it,' and she ran off.

'Can you come to Dene Farm with me?' asked Flossie. 'I'm going to buy some lop-eared rabbits.

You may help me to choose them.

'I wish we could have some too,' said Rosie;

'but Father doesn't like them.'

'I always tease till I get what I want,' said Flossie, who was a spoilt only child. 'Come on, hurry up!

'I can't-I'm looking after the children. Mother and Miss Greene are away, and Nurse is out.

'I know I wouldn't act as nurse-maid,' said Flossie, disdainfully. 'I see the children under the tree. Baby is asleep, and Toddles is in the hammock. Surely you can safely leave them for a few minutes, while we run over to Dene Farm.'

'I'll just go and tell Toddles not to stir till I

come back,' said Rosie.

'If you do, he will want to come-let's slip off

while he isn't looking,' said Flossie, and Rosie agreed, not without a qualm of conscience. They went across the road to Dene Farm, and were soon looking at the rabbits. Flossie took a long time to choose, and it was over half-an-hour before they returned to 'The Cedars.' Rosie ran up the drive to the lawn. Baby was still fast asleep, but Toddles had vanished, and Teddy Bear with him. How had he managed to get out of the hammock? Rosie wondered. Perhaps Cook had taken him! She ran to the kitchen door, and Cook, who was making jam, exclaimed as she saw the little girl: 'What do you want, Miss Rosie? Run away, I'm

'Have you got Toddles, Cook?'

'Why should I have him, Miss? Nurse said you were going to look after the little ones, while she went to the laundry. Surely you didn't leave them?'

'I-I only went to speak to Miss Flossie at the

gate,' stammered Rosie.

'Then you'd have seen Toddles, if he ran out on the road. He must be somewhere in the garden. It's a good thing he hasn't got out, for what with motors and Willow Pond, this is a dangerous road for children.'

'I wasn't quite all the time at the gate,' Rosie owned. 'We went to Dene Farm to look at

rabbits.

' How could you leave those babies alone? Why didn't you ask me to have an eye to them-jam, or no jam! Oh, dear! I wonder where the child is!'

Lifting the great preserving-pan off the fire, Cook hurried out, followed by Rosie, who was thoroughly frightened now. They searched high and low, but there was no sign of Toddles, and Jimmy, the garden-boy, said he had seen the child at the gate, but he thought Miss Rosie must be there too, so he did not call the little boy back.

At this moment Nurse arrived, and was very angry when she heard about Toddles. 'How naughty of you, Miss Rosie!' she cried. 'Where can he be? I'd have met him if he came towards the village. He must have gone to the pond-he

is so fond of it!'

'We must all go and look for him,' said Jimmy, and he was sent off to look for the child at the neighbouring farms and cottages; Cook took charge of Baby, and Nurse hurried towards Willow Pond, with Rosie creeping behind her. But they found no trace of the missing boy till they came in sight of the wide, willow-fringed sheet of water, when Nurse stooped to pick up something from the road, and said in dismay: 'It's Toddles' hankie! Then he has come this way. Oh, dear! he was asking this morning if he couldn't take Teddy Bear for a swim in the pond, and you know how deep it is.'

She ran to the pond, and saw the mark of tiny feet right to a spot where the bank had broken away freshly, just over the deepest part, and she gave a cry of despair, while Rosie began to cry.

'It's all your fault, you wicked girl, and all your tears won't bring my pretty lamb back. I was wrong to leave the children in your care, but I thought you could be trusted. Come home, we can do no good here. The pond must be dragged.'

They hastened back, meeting Jimmy on the way, and Nurse sent him to get men to drag the pond. Cook was waiting at the gate, and looked very grave when she heard Nurse's tale, but persuaded her not to wire for Mr. and Mrs. Trevor yet.

As she finished speaking, a man came up to them, and asked: 'Have you lost a little boy? I've just come with my wife and family to live at Willow Cottage by the pond. I've got work at Dene Farm. I was going back to the farm, when I heard a child's voice, and saw a little chap standing on the high part of the bank, above the water, talking to a Teddy Bear. I was some way off, but I ran towards him—it was so unsafe to have that wee lad there alone. But before I could reach

him, he stooped over the pond, and dipped the bear in, the bank gave way, and he went in with a splash. I'm a strong swimmer, so I jumped in and got him out, and his Teddy Bear too; and as I didn't know where he lived, I carried him home to my Missus, and she soon brought him to, got off his wet clothes, and put him to bed. I got into dry things too, and came out to find out where he lived. I met some men who said they were coming to drag the pond, as it was feared a little boy had fallen in. I told them he did fall in right enough, but he was safe and sound in my cottage, and then they told me where he lived, and I came here as fast as I could to set your minds at rest.'

Nurse thanked him earnestly, and bade Jimmy get the pony-trap, and very soon she drove off to Willow Cottage, and brought Toddles home, wrapped up in blankets, but apparently not much the worse for his adventure.

Mr. and Mrs. Trevor were shocked when they heard of the accident. Had it not been for the kind man, the child would certainly have been drowned; and Rosie sobbed out her remorse and penitence, but she had learned a bitter lesson, and from that time she tried to be less thoughtless and selfish.

M. E. SARGENT.

WATER POWER.

By P. M. BAKER, B.Sc., M.B.E., A.M.I.E.E., A.M.I.Mech.E.

Illustrated by BERNARD WAY.

(Continued from page 13.)

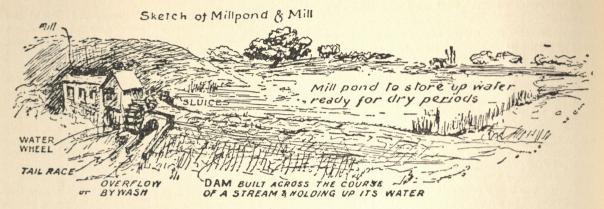
THERE are many wheels of the breast type in Great Britain, and it is interesting to calculate the power they develop and to see how small it is, in most cases, and how much of the original power of the stream is lost. The great wheel at Laxey (well known to visitors to the Isle of Man), which has probably a bigger diameter than any other wheel of the same type in the world, yields much less power than can be obtained from more modern machinery of very much less weight and size.

The stream from which the water is taken naturally varies from day to day; it may flood after heavy rain and dry up in drought, so the miller usually built a dam across the stream, at a convenient point (fig. 1), so that a mill pond was formed, and thus he provided himself with a reserve of water for dry weather conditions. Modern engineers have to do the same sort of thing, on a much larger scale, in their big

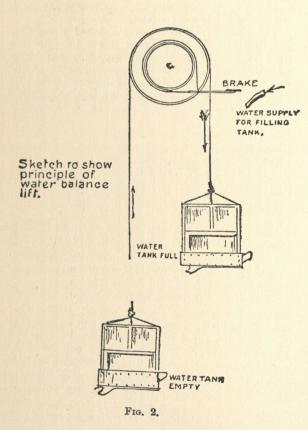
works.

An interesting development of this 'gravity' type of water-driven machine is the water-

balance lifts which are to be seen in various places, particularly along our coasts (fig. 2). There are examples to be seen at Shanklin, Aberystwyth, Lynton and Lynmouth, Bridgnorth, Folkestone, and other places. In these lifts there are two cages or cars attached to each other by means of a wire cable, which passes over a pulley or sheave at the top of the hill which is to be climbed, and each carries a tank which can be filled with water at the top and emptied at the bottom, so that the cage or car with the full tank pulls up the empty one. There are naturally brakes on the pulley and other safety appliances, but the general arrangement is very simple. If the water of a stream at the hill top is used to supply the tanks, as is preferred, the whole arrangement may be considered as a means of obtaining power from Nature, but very often water is scarce at the upper level and then a gas or steam engine has to be used to re-pump the water for use over and over again, and that removes the lift from the 'prime



Frg. 1.



mover' class. The diagram shows two cages which move vertically as is the case at Shanklin, but in several of the examples mentioned above two cars run on rails up and down an inclined way.

Modern Apparatus for utilising Natural Water Power.—The machines which we use nowadays

to enable us to utilise Nature's stores of water power are called 'turbines.' There are various types of turbine used, but, so far as general principles are concerned, we need consider only two kinds—one which is best adapted for use when the head (i.e., the number of feet fall between the water 'intake' and its 'outfall') is great, the other generally used for medium or low heads.

Turbines for use on high 'Heads.'-The turbine most frequently used on high headsheads of 1000 feet or more are often available in mountainous country—is known as the Pelton wheel and is a simple and highly efficient appara-It consists of a wheel or disc fixed to a shaft and carrying on its edge a number of vanes or 'buckets' which have the form of two half cylinders side by side. Fig. 3 is a section of one of these double cups or buckets, fig. 4 a sketch of one double cup, and fig. 5 a picture of the turbine wheel without its casing or bearings, and from these illustrations you will see how this turbine acts. The water intended for the use of this turbine is brought to it by a strong steel pipe terminating in a nozzle from which the water issues in a straight and true jet much resembling the jet from the nozzle of a fire hose. The arrows show the direction in which the water flows.

When the water issues in this way a change has taken place in the form of the energy which it contains. Inside the pipe and when the water is not flowing, the whole of its energy, or ability to do work, is due to the *pressure* on the water, but when the water has issued freely in the form of a jet it is no longer under pressure (for if it were, the jet would spread out and we see that it does not), and its energy is now due

to the *velocity* with which it moves. This introduces us to a new idea, viz., that there are two forms of mechanical energy—that due to position or pressure, called 'potential energy,' and that due to velocity of movement, called 'kinetic energy.' In the jet the potential or pressure energy of the water from the high-level intake has been converted into kinetic or velocity energy.

This jet strikes the sharp angle between the cups or buckets so that the water swirls forward velocity; if slower, it has backward velocity, and in either case it carries away some of its kinetic energy, which is thus wasted. Think it over and you will find that this is true.

This involves the use of a governor (fig. 6) to adjust the opening of the jet and so control its size and power without altering the speed of the water. In this case the speed of the wheel is controlled by means of a 'spear' valve (fig. 3). If the speed is too high the spear head is pushed

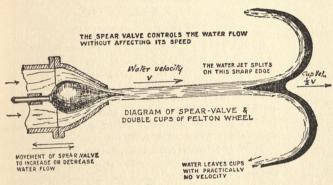


Fig. 3.



Fig. 4.

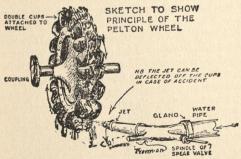
round them. As the water strikes the cups it drives them forward, but is itself left behind when it has done all the work it can. The wheel is arranged to rotate at such a speed that the buckets travel at half the speed of the water issuing from the jet. The water entering each cup is thus brought practically to rest and so gives up very nearly all its energy to the wheel, except such small amounts as are lost in the friction of the water against the cups. An interesting fact with reference to this form of turbine is that it can only work efficiently at a definite speed, for, if the buckets or cups travel faster than half the water speed, the water leaving the buckets has

forward by the governor into the jet, so that it reduces the flow of water without introducing any sudden change and without affecting its actual speed.

Wheels of this sort are frequently made for heads of from 1000 to 2000 feet. The speed of the edge of the wheel has to be very high with such heads, for the speed at which the water issues freely from the jet depends entirely on the head. You may calculate it, if you wish, from the formula

 $V = 8 \sqrt{h}$

where v is the speed of the water in feet per second, and h is the head in feet. If you work this out for 1600 feet head you will get a water



PELTON WHEEL

R ALIERNATOR

GOVERNOR

COUPLING

ALTERNATOR

BLARIMA

WHEEL

WATER LINING

WHEEL

WATER LINING

MICHAEL

MALERNATOR

BLARIMA

Fig. 5.

velocity of 320 feet per second and a cup speed of 160 feet per second, which is equivalent to nearly 110 miles per hour, about twice the speed of an express train. If the wheel had to run at 300 revolutions per minute—and its speed of revolution is usually decided by the builder of the electrical machine which it drives—it has to have a diameter of about ten feet measured between the centres of the cups on opposite sides to give the required cup speed. You can check my figures and may find it interesting to do so!

(To be continued.)

A WONDERFUL MOTHER.

THE Sand Wasp is a mother who makes the most careful preparations for her young whom she will never see.

She burrows into the earth and at the end of the tunnel builds three or four cells. Then she goes hunting for the caterpillar of the turnip moth, commonly called the 'grey worm.' Each segment of this creature has in it a bundle of nerves. Every one of these the wasp numbs by a stab from her needle-like sting. Her grub when hatched will feed upon the caterpillar, and it must not be dead. He also has big strong jaws, so she squeezes his head to prevent him nipping her, for she does not stab the head-nerves. Once the 'grey worm' is taken to her cell, she lays an egg upon it, and goes off to do the same thing again until all the cells are occupied. Then she goes away.

The eggs hatch out; the grubs find their larder well supplied; they spin a soft bed in which to settle down to sleep; and before they emerge as sand wasps, their mother is dead.

MAUD MORIN.

BRAVADO.

IT happened once upon a time
A merry boy of five
Said, 'I am not the least afraid
Of anything alive!

'Why, suppose a roaring lion,
Or hungry welf should stray,
And come prowling round the garden,
I shouldn't run away!

Do you think a snarling tiger, Or grizzly, shuffling bear, A raging, stamping buffalo Would make me turn a hair?

'Suppose now, Mother, that a bull Crashed through the garden wall, I'd take my gun and shoot him dead, And have no fear at all! 'And even if a rattlesnake
Came gliding down the drive,
I shouldn't run away, you know,
But capture him alive!

'And really if an elephant . . .'
(He shricked and danced a jig,
For slowly up the garden path
Came walking on—a pig /)

H. L. G.

FROM CHATTERBOX OF SIXTY YEARS AGO.

II.-BAD COMPANY.

A FARMER, who had sown one of his largest fields with corn, found that the neighbouring crows, not having the fear of the law before their eyes, made their way there and helped themselves freely. The farmer, not being willing to lose his crop, determined to drive the thieves away. He loaded his gun with the intention of giving them,

upon their next visit, a warm reception.

Now the farmer had a parrot as talkative and mischievous as those birds usually are, and, being very tame, it was allowed its freedom to come and go at pleasure. Strolling around some time after the farmer's declaration of war against the birds in general, and crows in particular, whom should the parrot see but a number of those bold black robbers busily engaged in the farmer-like occupation of raising corn. 'Pretty Poll' being a lover of company, without much caring whether it was good or bad, hopped over the hedge and was soon engaged with them in what I suppose was quite an interesting conversation on the many advantages of a country over a city life. Their friendly talk might have been prolonged, had not a passing wind wafted it to the ears of the farmer, who was leisurely sitting by his cosy fireside.

Up he started, and with his gun he sallied forth. Reaching his cornfield at length, he saw at a glance (though he overlooked the parrot) the state of affairs. Levelling his gun he fired, and with the report was heard the death-cry of three crows and

a shriek from poor Poll.

As the farmer advanced to see what execution he had made, the unwounded crows arose in the air, loudly pleading their cause as they departed. On looking among the killed crows, great was his surprise to see stretched upon the ground his mischievous parrot, with feathers sadly ruffled and a broken leg.

'You foolish bird,' cried the farmer. 'This comes

of keeping bad company.'

The parrot did not reply—probably because it did not know exactly what to say; but it looked very solemn, which answered just as well.

He carried it to his house, but his children,

IBRARY

seeing its wounded leg, exclaimed, 'What did it, Father? What hurt our pretty Poll?'

'Bad company-bad company,' answered the

parrot in a solemn voice.

'Aye, that was it,' said the farmer. 'Poll was with those wicked crows when I fired, and received a shot intended for them.'

With these words the farmer turned round, and with the help of his wife bandaged the broken leg, and in a few weeks the parrot was as lively as ever.

But it never forgot its adventure in the cornfield, and if ever the farmer's children engaged in play with quarrelsome companions it used to call out to them, 'Bad company—bad company.'

THE DIM RED DAWN.

By MRS. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. FARMER.

(Continued from page 29.)

CHAPTER IV.

THE WATER THAT RAN.

IT was fortunate that the time at Lulu's disposal was not too limited, for Dilda kept Zip-Zip hard at work for the rest of the evening. Her tasks over, Zip-Zip, very weary, could only remain awake to eat the food that had been left for her. If Dilda had had her way, Zip-Zip's share would merely have sufficed to keep her alive. But Lulu, since Zip-Zip's arrival, had refused to hunt regularly for the family larder unless the small slave were treated in this respect fairly. And, since Dilda and Brild were both very lazy, Lulu could impose her own terms to some extent. Dilda scowled as she watched Lulu scooping a good helping from the pot for Zip-Zip, but she was so busy discussing Zend's death she did not make herself as obnoxious as usual.

'Ullah is like a woman who has been hit on the head,' said Dilda. 'Though she screamed at first, she is stunned and silent now. Perhaps she is frightened because she must keep Zend company till the earth covers him, in case his spirit should need her. I would not like to be

in her place.'

'Ullah is frightened of everything,' Lulu retorted. But she, also, was too preoccupied for lengthy argument; nor, in truth, did she relish the thought that Zend's spirit might be watching herself at the moment. She would not fail it finally, but she had done so little as yet to reassure it, she did not want it too close. She was not sorry when the time came to peg down the skin curtain over the hut doorway, with the five of them safely inside, for, so tightly did it fit, there did not seem room for even a spirit to slip through.

She slept a shade restlessly, and woke with the first of the daylight. Zip-Zip, awake too, was already attending to the fire outside, and Lulu joined her. It had been stoked so carefully overnight that it was still glowing. Zip-Zip had only to blow the red heart to a flame and heap new fuel upon it. Close to its warmth she and Lulu crouched, for, though summer was near, the air was frosty. At least neither Bobo, Dilda, nor Brild was likely to emerge until the sun was higher; they two could confer in peace.

'Zip-Zip,' Lulu began, 'I told you yesterday I had vowed a vow and sealed it with blood.'

'But what was the vow?' Zip-Zip questioned. 'That you didn't tell me; there wasn't time.'

'I vowed I would save Zan,' Lulu explained.
'I promised Zend. I crept into his hut yesterday, while he could still talk, when we came back from the river, and you were cracking those bones.'

'Zan?' Zip-Zip faltered. She, too, knew by this time that Zan was in danger. Round every fire there had been talk of the child on the previous night, of his fate, and of Zend's successor. Zip-Zip had heard the gossip as she went to and fro; the tribe's opinion was that of the elders. That Lulu might be hurt if she interfered was Zip-Zip's first thought.

'Churruk will be very angry if you thwart him,' she urged. 'Churruk is merciless when

he is angry.'

'I promised,' Lulu reminded her, loftily, comfortably brave in the morning light. 'We shall have to take Zan away; we shall have to hide him. But where? If it is close to the huts he might be found. If it is somewhere far off——'

'If it's somewhere far off,' Zip-Zip finished for her, 'we should become outcasts. Zan is too young to be left all alone; the wild things would finish him as quickly as Churruk. If we went to him, and returned here daily, we

should be tracked. Yes, we should have to become outcasts,' Zip-Zip repeated, still somewhat fearful, but so pleased now she realised she was to accompany Lulu that whither she

went did not matter to her greatly.

'Outcasts?' said Lulu, thoughtfully, and sat silent for a little, looking into the heart of the fire. It had been amusing to picture Churruk as an outcast. She was not sure it would be quite so comical if she herself were in the same position, hampered by Zan. She jumped as Zip-Zip touched her arm.

'I have thought of something we might do,' Zip-Zip began, excited evidently. 'We might find the place where my people lived; there,

we might be safe.'

'Where did they live?' Lulu asked, interested. Zip-Zip so rarely talked of her past because of the terror in which it had ended. It was only in order to help Lulu that she recalled it now

'They lived where all one side of the world is water,' said Zip-Zip, and Lulu stared. The river she knew, but the river had land on the further side. 'Water that came and went,' Zip-Zip added; 'now it was near, now it was far away. It ran about as it pleased.'

'It shrank as the river shrinks when there has been no rain for a long time?' Lulu

questioned.

But Zip-Zip shook her head. 'If it rained, or if it did not rain, there was just as much water,' she insisted. 'It went away and it came back of its own accord. We used to say that something pulled it, perhaps, and then let it go; but we never saw the something. It was queer water. Not like the river water, sweet to taste; it was salt. We could not drink it, but it left behind fish we could eatfish in shells with claws, and swimming fish in pools. But sometimes my people got tired of fish. That was why they were trespassing; they wanted meat. But we should find the fish useful—they are always there. And they cannot escape like the river fish. The pools were not very big; they could not get away.'

Lulu nodded. A constant supply of fish would certainly be of the greatest use. But where had Zip-Zip's people sheltered? The water that ran about might prove difficult to deal with; to be at its mercy would be very

awkward.

'Perhaps the huts in which you lived have tumbled down by this this time?' she suggested. 'We did not live in huts,' Zip-Zip explained.' We lived in caves that ran back into great cliffs. They were much warmer than huts, and much safer, because there were many winding, narrow passages leading out of them, where we could hide or defend ourselves if we were

pursued.'

'Um!' said Lulu. She had been listening with growing excitement that matched Zip-Zip's own. Not only had the latter's proposal, it seemed to Lulu, much to recommend it; not only did it promise a way of escape, but it was in itself attractive. Lulu had been growing weary of the country in her immediate neighbourhood; she knew it so well. Already she was longing to see the water that came and went, and to taste it; to explore both caves and passages thoroughly. But one question remained that must be asked, and answered satisfactorily. Was Zip-Zip any real use as a guide? Did she know in what direction the caves and water lay? To set out merely in the hope of finding them, even Lulu felt might be too rash.

'Where are the caves and the salt water? How long will it take to reach them?' she asked. And, to her relief, Zip-Zip answered

confidently.

'At the river's end. If we follow the river down-stream we cannot go wrong. My people travelled up-stream, keeping always in touch with the river, so that they could find their way home again, and never be without water to drink. The caves could not have been very far behind us, for I know it was not long before

Zend trapped us.'

'We will go to your caves,' Lulu thereupon decided. At night-time for a little while she, Zip-Zip, and Zan could surely take refuge in trees from wild beasts; or, if they found themselves in open country, might light a fire to scare wild things away. Yet the caves seemed sufficiently distant from the settlement to make it improbable Churruk would follow thither. Once beyond the tribal boundaries, which only covered a limited stretch in any direction, they would be safe from him in any case, Lulu judged. He would almost certainly take for granted they could not survive in a strange country. It was possible, of course, that some other tribe had already taken possession of the hunting-grounds of Zip-Zip's clan, but that must be risked.

'Yes, we will go to your caves,' said Lulu

again. (Continued on page 42.)



. Go, and find out!' Churruk roared."

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c. Illustrated by E. S. FARMER.

(Continued from page 40.)

CHAPTER V. BRILD LISTENS.

THE day had grown warmer while Lulu Hut after and Zip-Zip were talking. hut had yielded up its inmates. Now the men most skilled in the chase were gathering round one of their number who was pointing

to each in turn.

'He is counting by tens,' Lulu realised as the pointing finger stopped. The man at whom it had halted ran to his hut for his weapons; then To him, Lulu disappeared in the forest. gathered, had fallen the honour of hunting for the food Zend's spirit required. Round went the finger again six times, and the six chosen began to dig a huge hole with their spears and their hands. Outside Zend's hut the women who were best at stitching skins had collected; each had brought a large bone needle in which an eye had been bored by persistent scraping. Ullah was coming out of the hut carrying an armful of skins; she went back for an assortment of weapons to be polished. All the time she was sobbing weakly.

'She can only cry. She will never put up a fight,' said Lulu to herself, scornfully. Then out from the hut ran Zan, pushing past his

mother.

'Come back, son. Come back!' Ullah called anxiously, but the child paid no attention. His mouth was firmly set, though he looked bewildered. At a little distance from the hole that was being dug, he stopped to stare. No one molested him, but no one befriended him. As Lulu watched she realised that, already, he was set apart. Yesterday there would have been a score of friendly greetings for him; to-day, there were none. In a sense it made her task easier. Zan would listen to her more readily if he felt forlorn. And listen to her and obey her he must if she were to be successful, but as yet he had yielded to no authority but Zend's. After a moment's thought she strolled up to him.

'Would you like to come hunting with me, Zan?' she asked. Since he was too young to understand his danger fully, she thought it

safest to appeal to him thus.

'Yes,' Zan agreed eagerly. On the stubborn little face he lifted to hers was a pleased smile. 'My father says you know how to hunt.' And Lulu seized on the clue he had given her.

'I promised your father I would take you soon, she told him. 'Perhaps I shall come in the middle of the night. Be ready. Don't

make a noise.'

'I will be ready,' Zan promised promptly. Then, as reluctantly he condescended to return to his mother who was still calling to him, Lulu began to wonder what attitude Ullah

would adopt.

Was it just possible that, though she might not have the courage to fight for Zan's life, she would insist on accompanying him? She could not come. She would be merely an incumbrance. She must certainly stay behind. That must be made clear from the start.

For the moment it was impossible to speak to her, for the women, polishing and sewing, formed a guard. But at the earliest opportunity she must be told that Zan would go and

she be left.

Ullah was hugging the child close as Lulu paused to look admiringly at Zend's weapons. It seemed a pity they must all be buried. Surely Zend's spirit could not need so many? In his lifetime he had never used the whole at once. There was a stabbing spear, big, but so beautifully balanced that Lulu felt sure she could handle it though it was meant for a fullgrown man, and a perfect sling. Zend had let her use the sling occasionally in his lifetime; she knew its worth. So many slings were just a shade too long, or too short. This was just right.

'He let me use it,' Lulu repeated to herself as she rejoined Zip-Zip. Something, she was aware, was shaping in her mind that promised well, but needed courage. Zip-Zip was collecting dry sticks for the fire on which she had set a pot to boil. She welcomed Lulu eagerly with

a new suggestion.

'If we go to the caves, we shall need food before we reach them,' she whispered. 'Shall we dry the salmon? It is big enough to last us for some time, and we should not have to waste hours in hunting.'
'Yes, we'll dry it,' Lulu agreed, a shade

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abstractedly. Then she, too, whispered as the vague something took a definite form.

'I've been looking at Zend's weapons,' she said. 'If we could take the best with us, they'd be very useful.'

'But we can't,' Zip-Zip flashed back, horrified. 'Zend's spirit might attack us if we robbed

'It would be for Zan,' Lulu answered, not altogether sure, however, that she had convinced herself. And Zip-Zip looked so scared she ceased to argue, and turned her attention to the salmon instead.

Brild, who was sitting by the fire intent on the steaming pot, watched furtively as his cousin and Zip-Zip unhooked the fish from the tree, and began to rub off the After a little, he edged nearer, scales. smiling oilily.

'What do you want?' Lulu demanded

'Nothing! nothing!' Brild protested. 'I was just thinking how clever you were to catch such a great big salmon, and what a lot of it there is.

'None too much,' Lulu told him, while Brild's face fell. He never grasped, until too late, that flattery was wasted on his cousin. He still kept close in case she should

'There is plenty. Let him have some,' Zip-Zip murmured. 'He will leave us alone then.' Advice which did not altogether commend itself to Lulu, but which she decided, after thought, to take. She did not want to be bothered with Brild at the moment, and the surest way to keep him quiet was to feed him.

'Here!' she said scornfully; and chopped off a chunk of salmon from the least good part next the tail, and flung it in his direction.

Brild ran to pick it up at once, stuck a broken arrow through it, and began to toast it. He could hardly wait until the lump was cooked before he was cramming it into his mouth. He watched them whispering together, his ears pricked. Nothing came amiss to Brild that he could possibly turn to his own advantage. But it was little that he gleaned, for they were careful.

'You won't really take those weapons?' he

heard Zip-Zip say.

'Perhaps I will, perhaps I won't,' Lulu 'Now we will look for slingstones. We had better have a good supply

'They are going hunting,' Brild concluded, disappointed. The salmon was finished. He looked idly round in search of entertainment, and, in the distance, caught sight of Churruk, and was reminded he had done nothing as yet to win the new chief's favour. And Churruk, Brild felt certain, would not be scrupulously just like Zend. Those to whom he was partial would profit in proportion.

'Perhaps I could pretend I've found out something,' Brild plotted. 'I might tell Churruk that Lulu and Zip-Zip have a secret they are

keeping from him.'

It was not much to offer, he had to admit. But, for details, he hoped he could trust to his imagination, and he wandered towards Churruk, who chanced to be alone. It was nearing the hour at which the tribe, as a whole, fed, and food had always the first claim on its attention.

Churruk, hungry, was not in the best of He turned a scowl on Brild who, frightened, shrank back. But so good an opportunity might not be his again, he well knew. Other more important people were also bent on winning Churruk's friendship. Food-time once passed, Zend's successor would be surrounded.

'What are you doing here?' Churruk growled. 'Get back to your own fire. I have

nothing for you.'

'I want nothing. Nothing,' Brild once more protested. Never courageous, he was already confused. He might have run away had not Churruk caught hold of him, and shaken him till his teeth chattered.

'What is it? What is it?' Churruk

reiterated.

'Lulu and Zip-Zip have a secret,' Brild wept, now so terrified the details on which he had counted eluded him.

'What is the secret?' Churruk at that demanded so fiercely that Brild collapsed com-

'I don't know,' he acknowledged. Churruk, great, wonderful Churruk, let me go,

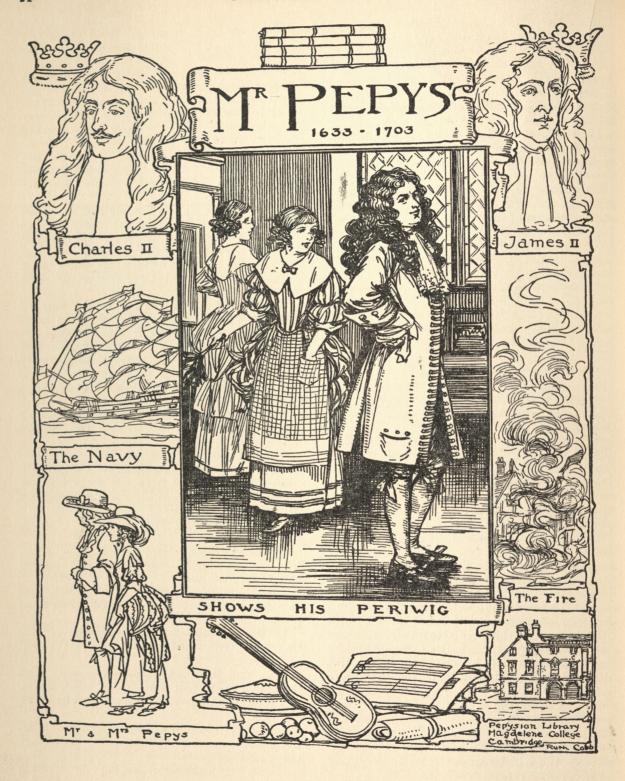
he begged.

'Go, and find out,' Churruk roared. Out shot his great foot and away shot Brild. 'Find out or you pay. Find out, and be quick

'Why did I tell him?' Brild lamented as he limped homewards. 'What will he do to me?

Oh, what will he do?

(Continued on page 54.)



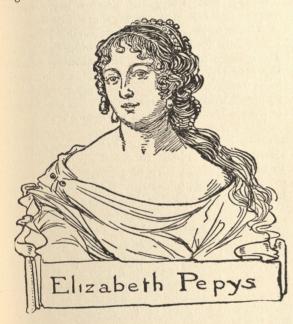
MY DIARY.

Written and Illustrated by RUTH COBB.

II.-SECRET DIARIES: SAMUEL PEPYS.

JANUARY 1sr, 1659. 'Blessed be God, at the end of last year I was in very good health... I lived in Axe Yard having my wife and servant Jane and no more in family than us three... My own private condition very handsome and esteemed rich, but indeed very poor, besides my goods of my house and my office which at present is very uncertain.'

So opens the most famous of English Diaries, written by one Samuel Pepys, who lived in the reigns of Charles II. and James II. It is not



known why Pepys suddenly began to keep a diary, for he seems never to have attempted to do so earlier in his life. An unusual thing about it is that the diary is in cypher, in an early form of shorthand invented by Shelton in 1641, further complicated by variations of Pepys' own and by the use of foreign languages. It seems as if Pepys intended that no one should ever read his diary besides himself -at any rate till long after he was dead-and probably he specially wished to keep it from the eyes of his wife. He did once mention to a friend that he was keeping a diary, and immediately regretted that he had said anything about it, 'it not being necessary or maybe convenient to have it known.'

Pepys left all his books and papers to Magdalene College, Cambridge, where he had been a scholar, and among these was his diary. But it was not until 1819 that the secret of its cipher was discovered by John Smith, the rector of Baldock in Hertfordshire, and from that time Samuel Pepys became famous to the world. His diary contains all his public and private doings and his vices as well as his virtues.

He had been a well-known man in his own day for other reasons. After leaving the University he became secretary to his cousin, the Earl of Sandwich, through him he became 'Clerk of the Acts' in the Navy Office and afterwards Clerk of the Privy Seal, a very important person. In such times there was much seeking after official places, and everybody was open to bribes. Friendship was much desired with Samuel Pepys, and though he was much honester than many of his contemporaries, even he probably made something in this way above his official salary.

Pepys married the daughter of a French Huguenot exile, who was only fifteen. He appears to have been very fond of her, though they constantly fell out, which is all recorded



The Dutch Fleet in the Medway, A.D. 1667.

in the diary. He was proud when people remarked on her beauty. But at times Mrs. Pepys was untidy in her dress, and that annoyed her husband. He did not approve, for instance, of the varieties of fashionable wig which she tried from time to time.

'My wife being dressed this day in fair hair did make me so mad that I spoke no word to her though I was ready to burst with anger. After that... Creed and I into the Park and walked a most pleasant evening so took coach and took up my wife and in my way home discovered my trouble to my wife for her white locks, swearing several times which I pray God forgive me and bending my fist that I would not endure it. She poor wretch was surprised with it and made me no answer all the way home, there we parted, I to the office late then home without supper and to bed vexed.'

At other times he takes her into the gardens of Grays Inn, then a fashionable promenade, 'to observe the fashions of the ladies.' There was one occasion after a quarrel, when she came to his bedside, 'drew my curtain open and with tongs red hot at the ends made as if she did design to pinch me'; and yet in a short time afterwards they were talking together with much enjoyment.

There are a great many domestic details in the diary. Pepys himself knew all about the household arrangements. 'Dined at home with my wife. It being washing day we had a good

pie baked of a leg of mutton.'

In those days the servants were on very familiar terms with their employers, and were practically part of the family. Much is heard of the maids, Susan and Mercer, and the boy Will. They went out, and even to the play, with Mr. and Mrs. Pepys, yet they had to work hard. We constantly hear of the maids being called at two and four o'clock in the morning on washing days. There were different ideas of personal cleanliness then and baths were a rarity. 'My wife busy is going with her woman to the hot bath, herself to bathe herself after her long being within doors in the dust, so that she now pretends to a resolution of being herafter very clean.'

Pepys himself was very fond of clothes and liked to be in the fashion. 'Put on my new fine coloured cloth suit with my cloak lined with plush which is a dear noble suit costing me about £17.' 'This morning my brother's man brought me a new black bais waiste coat faced with silk. He brought me also my new gown of purple shag also as a gift from my brother a velvet hat, very fine to ride in and

the fashion which pleases me.'

Periwigs, long wigs of curled hair, became the vogue. Pepys hears that the King and the Duke of York were wearing them, and determined to do the same.

'Home and by and bye comes Chapman the perriwig maker and upon my liking it, without more ado I went up and there he cut off my hair which went a little to my heart to part with; but it being over and my perriwig on I paid him £3 for it, and away he went with my own hair to make up another of: and I by and by went abroad after I had caused all my maids to look upon it: and they conclude it do become me, though Jane was mightily troubled for my parting of my own hair and so was Besse.' And the next day, 'To my office showing myself to Sir W. Batten and M. J. Minnes, and no great matter made of my perriwig as I was afraid there would.'

There were two things of which Pepys was extremely fond—music and going to the play. He constantly says, 'In the morning I fell to my lute till 9 o'clock.' 'A great while at my vial and voice learning to sing "Fly boy, flyboy" without a book.' He set some verses to music besides writing some of his own.

His fondness for play-going was somewhat on his conscience, 'troubled in mind that I cannot bring myself to mind my business but to be so much in love of plays.' He was very critical of what he saw, and does not appear to have cared much for Shakespeare. 'To the Dukes house to see *Macbeth* a pretty good play but admirably acted.' 'Romeo and Juliet a play of itself the worst I ever heard.' 'Midsummer Nights Dream—The most insipid ridiculous play, that ever I saw in my life.' He sat in the pit and ate oranges, as was the custom in those days. But he was also fond of going to church, commenting on the other church goers and the sermon.

In 1665 London was visited by the Great Plague, but Pepys stayed at his work in the town, while his wife and maid went to Woolwich. In a letter he wrote, 'The sickness in general thickens round us, particularly upon our neighbourhood,' and in the diary he gives account of the gruesome sights he saw. Then came the Great Fire. His own house was in danger. He prepared for leaving it. 'I did remove my money and iron chests into my cellar, as thinking that the safest place, and got my bags of gold into my office ready to carry away.' He describes how he 'saw the fire grow, and as it grew darker appeared more and more and in corners and upon steeples and between churches and houses as far as we

LIBRARY

could up the hill of flame, not like the fine flame of an ordinary fire a horrid noise the flames made and the crackling of houses at their ruins. So home with a sad heart and there find every body discoursing and la-

menting the fire.'

During the war with Holland the Dutch Fleet sailed some way up the Thames, and caused great consternation in England. The principal officials of the English Navy were called before the House of Commons, to answer the grave charges brought against them in consequence. Pepys made the great speech of his life in their defence, speaking for three hours. He gained much praise for it. tells what the different people said to him afterwards-how one man 'had sat twenty six years in Parliament and never heard such a speech there before, for which the Lord God make me thankful! and that I may make use of it not to vain glory and admiration.' was in consequence of this success that he decided to enter Parliament and became member for Harwich. When James II. came to the throne, Pepys was practically Minister for the Navy.

With the Revolution of 1688, his public career came to an end. For a short time he was imprisoned on a charge of conspiracy with the Jacobites. He spent the rest of his life quietly, at his house at Clapham, arranging his library; his wife had long been dead.

The Diary ceases on the 31st of May, 1669. For several years before, there had been entries of trouble with his eyes and he began to wear green spectacles. He feared blindness, and he wrote his last time entry: 'And this ends all that I doubt I shall ever be able to do with my own eyes in the keeping of my Journal I being not able to do it any longer, having done now as long as to undo my eyes almost every time I take a pen in my

So closes the volume to the world's loss—the revelation of a man full of the zest and the joy

LOST ON THE MOORS.

(Concluded from page 26.)

T must have been hours later when Babs and I both gave a cry together. We had bumped right into a rock as we were climbing up and up a hill that seemed never to end.

For hours we had been wandering, and we were so tired and disheartened that this horrid bump seemed the last straw. We just sat down where we were, and I think we both cried

a bit; at least, I know I did.

We had no idea of where we were; we might be many miles from home; we were cold and wet and beginning to be really nervous. So there we sat close together, shivering and trying to keep up heart, while the thick mists pressed close on us, hiding everything.

'If only it would clear for a minute,' I said. 'Then we might see whereabouts we are I stopped. Even as I spoke a wind stirred the dense curtain, and for a few yards about us it

thinned.

We jumped up and looked about us; we were in the middle of a circle of huge slabs of rock, some fallen flat, some still upright, some lean-

ing against each other. 'Babs!' I cried, 'we are on Stone Tor!' And then the fog fell again, and we were wrapped about in the blinding, cold, wet atmosphere.

'Ursula,' said Babs, 'let's try and get under the stones that look like a hut; they are just opposite us.'

It was a good idea, and we began to move carefully forward. Suddenly we both stopped Surely (it seemed impossible), but surely we had heard a voice speaking quite close to us? Yes, there it was again; a man's voice!

We put our hands out and found we were quite close to the stones we had been seeking for shelter. From behind them and muffled

by the fog sounded the voice again.

'It's to-night or never, Bill, it said. 'The manager's wife is ill and he is away with her to Plymouth, so the rooms over the bank are empty. The night-watchman is a feeble old fellow, and won't take more than one of us to settle him, and with this fog to cover us, we could do the job and get away, and not a soul be the wiser till the clerks go there in the morning. I've had my eye on Dynford Bank for a year or more, and to-night's the night. We can stay close here for another three hours; then we'll make a move---'

Babs and I heard no more. Holding hands, step by step we moved backwards away from that horrid, scheming voice until we had put some distance between us and it, and then we



"There it was again; a man's voice."

turned and ran into the fog, down the slope, stumbling over the loose stones and heather, down and down and down, till suddenly we went splash into water and found ourselves knee-deep in a river that we could not see, but could now, as our panic quieted, hear gurgling and singing along its rocky course.

'Ursula,' said Babs, 'those men are thieves! They are going to rob the bank where Uncle keeps all his money. Oh, what can we do? We must do something!'

'Let's think,' I said—'think hard. There's always something to be done. If only we could get home and warn Uncle, he would ride to Dynford and warn the police.'

'Why, Ursula,' cried Babs even as I spoke, 'we can get home. We have found a guide; don't you see? The river! It runs to the farm; we only have to follow it.'

'You're right!' I cried. 'That is what we must do, and we must hurry. It won't be easy in this fog, but we can't be lost again, anyway.'

'Not easy,'indeed! Never had we had such a scramble as we had that evening, following that winding moorland river in the thick mists, following it and making our way by sound and feel only. More than once did we stumble and fall into the water as we tried to walk on the slippery pebble bottom. We were cut and bruised and breathless, and it seemed to go on for ever and ever.

Suddenly the mists began to loosen; a wind

sprang up; we could see for some yards in all directions, and at the same moment we heard a dog bark.

'Why, that's Timothy!' I cried. 'And look, Babs, there's the barn! Oh, we're home at last!'

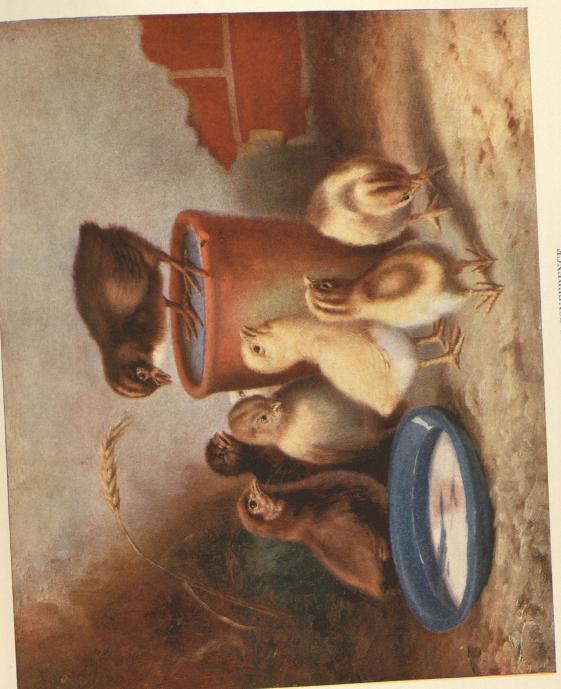
Babs was beyond words. She is not quite so strong as I, and she was so tired she could hardly stagger across the home meadow to the farm. At last the familiar, wide, welcoming doorway was before us, and we simply tumbled in and fell on the floor, while Auntie rushed at us with a cry of 'John, John, here they are at last!'

Then Uncle came in with Timothy, but even as he picked Babs off the floor I began to tell him about the bank and the thieves. I told just what we had heard, and before we had our wet things off we heard Uncle clatter out of the yard on Kitty, his fastest horse, and gallop off towards Dynford.

I think that is really the end of our adventure. Uncle got to Dynford in good time, and when the thieves broke into the bank, they found a body of police waiting for them, who arrested them at once.

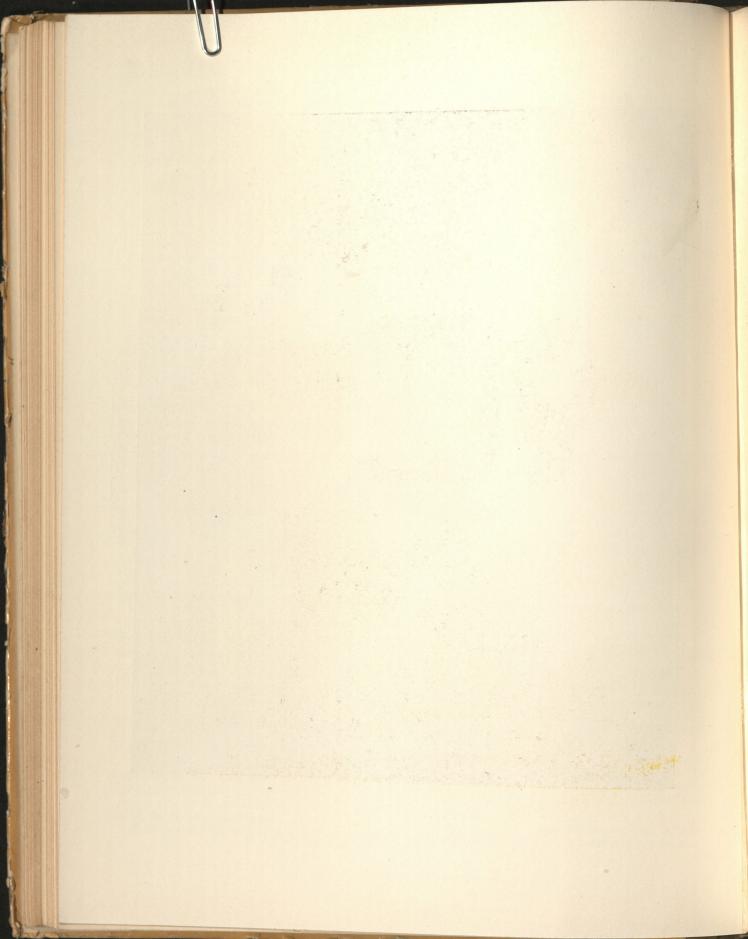
Babs and I were stiff and sore for some days, but otherwise none the worse. I think the worst of it all was that, to punish us for going so far without permission, all picnics were stopped for a week!

Still, it was a real adventure, and perhaps worth even that!



AN IMPORTANT CONFERENCE.

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What on earth is this? (See next page).

WHAT ON EARTH IS THIS?

THE black shapes on page 49 look like nothing on earth. But they can be made into some-

thing. Into what?

They fit together like the pieces of a jig-saw puzzle. But as the readers of Chatterbox will probably be able to fit them together with a little trouble, the Editor is not going to say what they make until he gives the completed figure, which appears on page 77. Do not look at the solution until you have done your best to put the figure together. The Editor of Chatterbox will only give one hint-the pieces make up the form of a man whose like was often to be seen in England when Chatterbox was young, but is not so common in our Diamond Jubilee year.

If you do not wish to spoil the page, get some thin paper, trace the outlines, colour them, and cut them out, and then try to fit them together.

THE PRIVATE OF THE BUFFS. *

Some Sikhs and a private of the Buffs, having remained behind with the grog-carts, fell into the hands of the Chinese. On the next morning they were brought before the authorities, and commanded to perform the Kowtow. The Sikhs obeyed; but Moyse, the English soldier, declaring that he would not prostrate himself before any Chinaman alive, was immediately knocked upon the head, and his body thrown on a dunghill.

'The Times' Chinese Correspondent. AST night among his fellow roughs, He jested, quaffed, and swore, A drunken private of the Buffs, Who never looked before. To-day, beneath the foeman's frown, He stands in Elgin's place, Ambassador from Britain's crown,

And type of all her race.

Poor, reckless, rude, low-born, untaught. Bewildered, and alone.

A heart, with English instinct fraught, He yet can call his own.

Aye, tear his body limb from limb, Bring cord, or axe, or flame: He only knows that not through him Shall England come to shame.

Far Kentish hop-fields round him seem'd. Like dreams, to come and go: Bright leagues of cherry-blossom gleam'd. One sheet of living snow:

The smoke above his father's door, In grey soft eddyings hung: Must he then watch it rise no more,

Doomed by himself so young? Yes, honour calls! with strength like steel He put the vision by.

Let dusty Indians whine and kneel; An English lad must die.

And thus, with eyes that would not shrink, With knee to man unbent,

Unfaltering on its dreadful brink, To his red grave he went.

Vain, mightiest fleets of iron framed; Vain, those all-shattering guns; Unless proud England keep, untamed The strong heart of her sons.

So, let his name through Europe ring-A man of mean estate,

Who died, as firm as Sparta's king, Because his soul was great.

SIR FRANCIS HASTINGS DOYLE. * First published in the year in which Chatterbox began to appear week by week.

'THIS LITTLE WORLD.'

SOME PORTRAITS OF GREAT BRITAIN. Drawn by J. A. SYMINGTON.

[NOTE.—For this series Mr. J. Ayton Symington has drawn a number of pictorial maps of some very English counties. The idea is to show Chatterbox readers—who live all over the world as well as in the United Kingdom—what a wonderful romance any one can make up, with a little knowledge and thought, about the county divisions of Great Britain.

'This happy breed of men, this little world, This precious stone set in the silver sea . .

This blessed plot, this earth, this realm, this England . . . This land of such dear souls, this dear, dear land.'

John of Gaunt knew his country - or Shakespeare in Richard II. put into his mouth the right words. But do we all know our own counties? Do we know who, in the old time before us, shaped our thoughts and our lives before we were born?

These notes on Mr. Symington's pictures cannot possibly cover all the beautiful and notable places in any one county. They are simply a selection of all sorts—and 'it takes all sorts to make' even a little world.]

ENT is the gateway to England from Central and Southern Europe. Dover is Kent's gate. There is nothing important in

the history of England which has not taken place or had an echo in Kent; and often Kent has started movements that spread all over England.

It is a very lovely county, and, except for waterfalls and mountains, contains almost every kind of English scenery, and very many branches of English industry. The North Downs, the three great ridges of the county, give us the green hills that every Southerner loves. In the east there are the new and growing coal-fields: on the west, still-growing London. Round the coast are prosperous watering-places, a great dockyard, a great nort, a great arsenal. The best fruits in England-apples and cherries and strawberriesgrow in its heart. It has, apart from the bordering Thames, its fine river the Medway. Kings and Queens have been born in it, rebellions have broken out, martyrs have died. Its seamen, from the days of Carausius, from the Cinque Ports, to H.M.S. Kent in the Great War, have faced all weathers and all seas. It has castles of all ages, from the Stone Age to the Great War-for the coast-defences are our equivalent to castles. It has sheep and cattle in abundance, rich meadows and pastures like those of Romney Marsh, the remnant of forests in the Weald, glorious parks like those of Knole and Penshurst, with their splendid houses. It has some of the best roads in the world, and, though you might not think it, some of the loneliest and most untouched little copses and villages a few yards away from those roads.

The places shown in the map are here described in alphabetical order. If you live in one of them, look up a good history (or often a good story or romance), and see what the life you have inherited in them was like in old days.

The populations given are those of the 1921 census. The whole county in that year contained 1,141,866 persons, and so stood eleventh in the list of English counties in that respect: it was lowest among those which contained over a million inhabitants, but the development of the coal-fields will probably raise it—if that is desirable! In acreage it was ninth, with 975,965 acres; but of course London has, so to speak, stolen a good piece of Kent in the north-east.

Ashford (population 14,351) is an important market town railway junction on the South-Eastern (now Southern) railway, and the rolling stock of that line is manufactured there. Shakespeare says that Jack Cade was an Ashford man, but this is very uncertain;

he is said to have been a tanner there. In his rebellion, at any rate, he fought all over Kent, though he was actually killed (1450) in Sussex. Sir Edward Osborne (d. 1591), Lord Mayor of London, was born at Ashford: a famous story tells how as a London apprentice he dived off London Bridge to save his employer's daughter from drowning. His descendants became the Dukes of Leeds.

BIRCHINGTON (population 3503) is an attractive seaside resort, in the Liberty of the Cinque Port of Dover. The poet Dante Gabriel Rossetti died there in 1882.

BOUGHTON MALHERBE (population 366) is a charming village with a wide outlook over the Weald of Kent. In its fine church are monuments to many of the Wotton family, who lived at Boughton Place (now a farmhouse). Here the most famous of them, Sir Henry Wotton (1568-1639), entertained Queen Elizabeth, who is said to have planted a fine yew tree, still standing and carefully preserved. Wotton served on many embassies, and died Izaak Walton, his as Provost of Eton. friend, wrote his life. Wotton was the author of some of the most beautiful of English lyrics—especially 'You meaner beauties of the night.'

Broadstairs (population 15,471) is a notably healthy watering-place, famous for its association with Charles Dickens and *Bleak House*. Queen Victoria also stayed there several times, as a child, with her mother, the Duchess of Kent.

Bromley (population 35,052) is now almost part of London. It has no great history. Bromley Palace, now a school, belonged to the Bishops of Rochester for many centuries: the present building was built in 1775. The older building had been a centre of Jacobite plots in the reign of Anne. Bromley College was founded in 1666 for the widows of the clergy. Dr. Johnson's friend, the essayist, John Hawkesworth, is buried in the parish church. Mr. H. G. Wells, the well-known writer, is also a native of the place.

Some of the earliest cricket matches ever played in Kent or in England took place at Bromley.

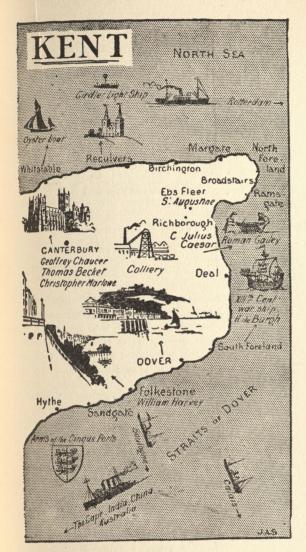
CANTERBURY (population 23,737) is in itself a summary of the history of Kent and of



Christianity in England. The glorious Cathedral is said to stand on the site of Ethelbert's palace, and the font in St. Martin's Church (supposed to be, at least in part, the oldest church in England, containing Roman brick in its fabric) is said to be that in which St. Augustine baptized Ethelbert in the year 697. Countless famous persons are buried in it, and, as every one knows, it was the scene of the murder of St. Thomas Becket in 1170. His shrine attracted innumerable pilgrims (whom Chaucer describes faithfully in his Canterbury Tales), and greatly enriched the Cathedral; but most of the rich ornaments

and jewels vanished at the Reformation or under the Commonwealth. The Black Prince is buried here in a rich tomb, with his armour and insignia hanging above it. The King's School (close to the Cathedral) claims to be one of the oldest in England. The West Gate of the old city wall still stands, and there are numerous beautiful houses in almost every street: the 'Weavers,' on a little stream, is very charming.

Canterbury is famous for hops and cricket. The Canterbury Week is known wherever cricket is known: a monument to Colin Blythe, the great Kent bowler, who fell in the Great



War, stands on the cricket ground. Another boast of the city is that it is the headquarters of the East Kent Regiment, the 'Buffs,' renowned for valour for many generations: Sir Francis Doyle's The Private of the Buffs is a very fine patriotic poem about a true event in

the regiment's history.

Christopher Marlowe, the poet, who might have been nearly as great as his friend Shakespeare, if he had not been killed in early life in a tavern brawl, was born at Canterbury and educated at the King's School. Barham, the author of the Ingoldsby Legends, was also a native of Canterbury. The Canterbury chapters in Dickens's David Copperfield are well known.

CHATHAM (see also ROCHESTER). The reason why Chatham is a great town, and has been so for many hundred years, lies in its geography. It is a natural port (with Sheerness to guard it), at a most convenient position on the Medway between London and Thames Mouth. But one inconvenience of that position was that the place had to be defended. It possesses a strong garrison, and one of the largest British dockyards. The Dutch knew its importance in 1667, when they sailed up the Thames and burnt the docks and ships, and went away unhurt.

One of the famous ship-building family of Pett was blamed for this disaster-Peter, then head of the dockyard, the son of Sir Phineas Pett. But it was not entirely his fault, as was proved. He died a few year

His father, Sir Phineas Pett, learnt the craft of a master-shipwright at Chatham, where he was assistant master. He afterwards became master at Deptford and Woolwich, where he built the largest ship in the English Navy of those days (The Sovereign of the Seas, launched in 1637: there is a model of it at the Royal Naval College at Greenwich).

Phineas, who died in 1647, was the son of another Peter Pett, who was master-shipwright at Deptford under Edward VI. Many other Petts were employed during several genera-

tions in these three dockyards.

The population of Chatham itself in 1921 was 42.013. For political purposes it is united with Gillingham (population 54,026) and Rochester (dealt with below—population Rochester (dealt with below—population 31,933). These three places therefore contain nearly 128,000 people, and together (they are virtually all one) make up one of the largest centres of population in the South of England -by far the largest in Kent.

At Gillingham, somewhere about 1560, was born the founder of the Japanese Navy-William Adams. He joined a Dutch fleet in 1598, and reached Japan in the only successful ship of the fleet. He was kept there by the Emperor—against his will—and built two ships for him. He had left a wife behind him in England, but as he was not allowed to return, married a Japanese. He died in Japan in 1620, and is buried there, under his native name of Anjin Sama. An annual celebration is still held in Japan in his honour.

Chatham certainly existed in Saxon times,

and so probably did Gillingham.

Cranbrook (population 3044) is a beautiful little town in the heart of the Weald, with a fine church and many interesting old houses. With Tenterden, a few miles away, it was made the chief centre of the cloth industry by Edward III. The old Cloth Hall, the meeting-place of the merchants, had fallen into decay, but has recently been splendidly restored as nearly as possible to its original condition by its present owner. The excellent School was founded in 1574, and obtained a charter from Queen Elizabeth when she visited the town. Cranbrook was also a centre of the

old Wealden iron industry, which is dealt with under Tenterden.

Dartford (population 25,952) has also an old history, for it stands where the Roman road from Dover, Watling Street, crosses the river Darent on its way to London. Here, in 1377, Wat Tyler's rebellion first broke out. The town has many industries, especially powder-making and paper-making. The first paper mill set up in England is said to have been established here late in the sixteenth century. (Continued on page 58.)

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

11llustrated by E. S. Farmer.

(Continued from page 43.)

CHAPTER VI.
THE RUSTLE BENEATH THE HUT.

LL unaware that danger threatened, Lulu A waited to confer with Ullah. Her chance came as darkness fell. At sunset Ullah took possession of the skins at which the women had been working, and the weapons they had polished, while they returned, each to her family. Zan and she were evidently to keep the night watch alone. Lulu had but to get inside the hut, and she could talk to Ullah at her leisure, unobserved. But the venture needed courage since Zend was there too; Zend, the silent and changed. Lulu felt it best to go quickly lest, in the end, she should not go at all. Like a moth she flitted through the flickering shadows cast by the numerous cooking fires. As she reached the hut, she felt for the pegs with which, she expected, the curtain would be fastened. If she could, she must draw them out herself. Ullah would be too frightened to open if summoned in a whisper, she guessed. To force an entry would be simplest.

But the curtain hung loose already; no doubt for the convenience of Zend's spirit. Lulu's hair stood on end as she grasped the fact, and wormed her way in. Perhaps the spirit was following her at that very moment. Did she

feel its breath upon her cheek?

'It's for Zan,' she told it aloud. And, at

that, heard Ullah gasp.

'Be quiet! Be quiet!' she urged, desperately, afraid a shriek would follow. 'It's me—Lulu.'

Ullah did not answer at once, still startled.

She was crouching by her hearthstone, and had lit a small fire. By her side Zan was curled, puppywise, asleep. Ullah was stroking him with one hand, while with the other she had been feeding the fire. She dropped a stick now with a grunt of pain, as a flame leapt up and caught, and scorched, her finger-tips.

'Lulu?' she breathed softly then. 'What do you want? Are you not afraid to come here?'

'Yes,' Lulu owned, perforce. 'But I had to come; to tell you I will save Zan. We will take him away, Zip-Zip and I, before Churruk can kill him.'

'But you could not look after him,' Ullah protested. 'You are neither of you old enough.'

'Um!' said Lulu, offended. Everything around her recalled the last time she had been in the hut. Zend had not seemed to doubt she could do what she had promised. 'Zan will certainly be killed if he stays here,' she argued. 'He won't die any quicker with us, anyway.'

'That is true,' Ullah acknowledged dully. The hand that was stroking Zan clutched at him suddenly. He stirred and woke; then smiled

at Lulu.

'Have you come to take me hunting?' he asked. 'I will get my bow and arrows.'

'Not to-night,' Lulu told him. She had already decided it would be best to start only a short while before Zend's burial, for more than one reason. 'Not to-night,' she repeated, therefore.

'Not to-night?' Zan echoed indignantly. He scrambled to his feet, stamping, but as he did

so, Ullah suddenly intervened. She flung her arms round her son and hugged him, her face transformed. It was eager, hopeful, tender, and she had ceased to tremble. Lulu watched, somewhat disdainfully. In her opinion, Zan needed smacking, but if Ullah could manage him, she was welcome to do so.

'Do not get angry. Wait patiently, little loved one,' Ullah entreated. 'When, Lulu—when?'

she questioned.

'Just before dawn on the day Zend is buried,'

Lulu told her.

'Yes, that will be best,' Ullah agreed to her relief. 'You will have a start, but will not have to face too much of the night. And no

one will pursue till all is over.'

Lulu nodded, satisfied. Ullah was behaving better now than had seemed likely. Not only had she quieted Zan, who was smiling again, but, so far, had not suggested, as Lulu had feared, that she should go with him. There seemed no point in lingering lest the idea should occur to her, and Lulu backed towards the door again.

All the time she had been in the hut she had kept her face turned towards the spot where Zend lay, for she felt safer thus. She was glad to be in the open once more, and drew a deep breath of relief as she looked round to locate the glimmer of her own home fire.

'Zend's spirit isn't here,' she told herself, and stopped, startled. Was that a rustle underneath the hut, sinister and threatening? Instantly she was racing towards the firelight. She did not stop till she sat down, panting, beside Bobo. On the other side of the fire was Dilda. Brild was absent, no doubt on some foolish business of his own. Inside the hut she could hear Zip-Zip moving, tossing and turning the rushes and heather on the sleeping platform, compressed and hard from the previous night, and thought of joining her. But Bobo had finished the tooth with which he had been occupied, and was now planning a new picture. As always, at such times, he needed an audience.

'I shall make a picture of Zend being put into the ground,' said Bobo. 'On many teeth. Perhaps enough to make a whole necklace,' he added, at which Dilda looked at him with

Brild's smile.

'For me?' she asked.

'No, for Churruk's wife,' Bobo decided, 'and we shall have a friend in consequence.' He looked at Dilda triumphantly. She was always telling him he had no forethought; she

could do so no longer. She grunted crossly, but to Bobo's surprise, Lulu seemed almost

equally annoved.

She hated to think of Churruk's wife gloating over Zend's end. It enraged her to imagine Churruk reigning, but . . . need he reign undisturbed always? What was it she had overheard? 'Children grow quickly. It would not be long before Zan might be a rival.' Deep in her own thoughts Lulu sat, while round her head flowed Bobo's soliloquy. He fancied, fondly, that his niece was listening. Instead, she was outlining a picture for herself.

In the caves beside the water that ran about, she, Zip-Zip and Zan would live, and Zan would grow. Lulu could see him growing, sprouting higher and higher. And some day—some not very distant day—they would bring him back to rule as Zend had ruled. So pleased she was

at the prospect, she beamed at Bobo.

'Ah!' said Bobo, delighted. 'Is it not a great idea? The necklace will be most wonderful. Perhaps a few of the teeth will have to be left blank. I am not quite sure yet how many I shall need.'

Lulu listened and smiled again. On those blank teeth some day Bobo should carve the triumph of Zan. She herself would snatch the necklace from Churruk's wife, and hand it to her uncle to be finished. She, who would be Zan's right hand, and have unlimited power—for Zan, of course, would depend on her guidance and always ask her what he should do. Into the hut she hastened to tell Zip-Zip, and as she disappeared, Brild joined his parents by the fire. He, too, was smiling, almost as triumphantly.

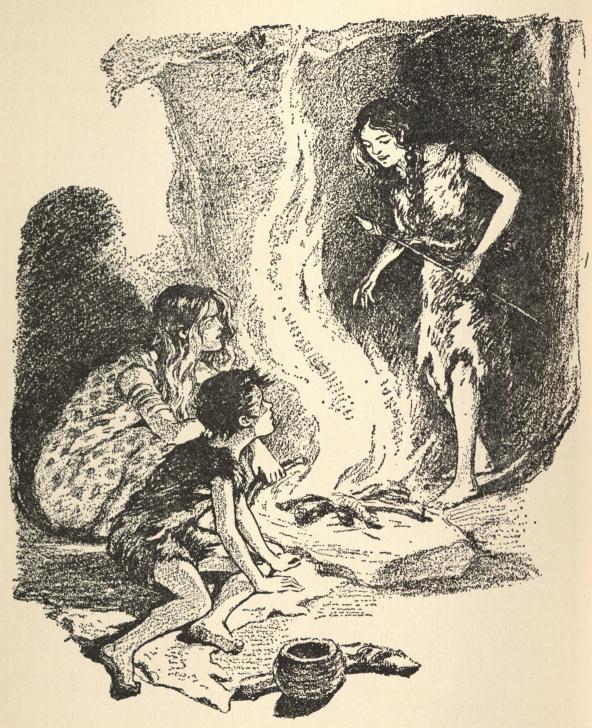
'Ha! ha! Lulu,' Brild was saying to himself.
'You though that I was Zend, did you? You ran from me. Now you are in my power. What a fine tale I have to tell to Churruk, who

will be very, very pleased with me.'

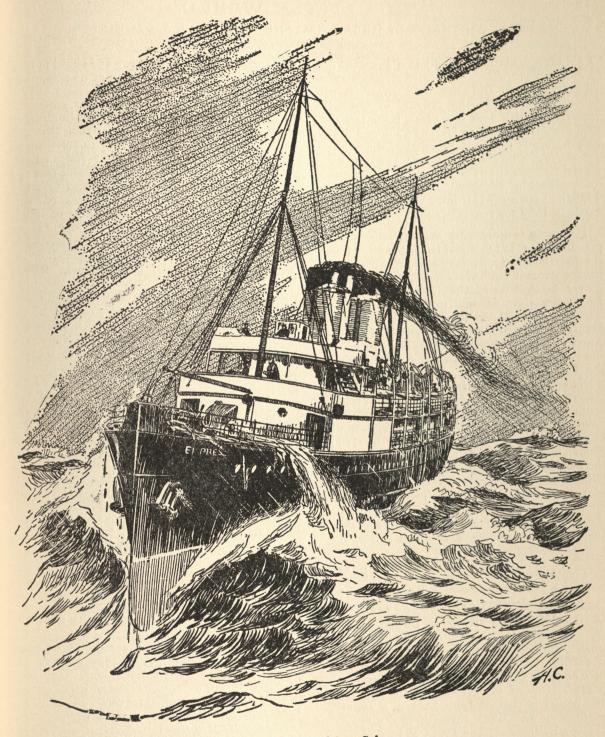
He laughed aloud, pleased with the coward's courage that had even enabled him to follow when Lulu went to talk to Ullah—to hide actually beneath dead Zend's hut, spurred by the prospect of an enraged Churruk. How well worth while to hide had proved! Through the chinks in the floor every word had been audible.

'Why are you laughing?' Dilda asked idly. But Brild blinked back at her and did not answer. All that he could extract from Churruk he meant to keep. He was not going to share it; not even with his mother.

(Continued on page 62.)



"Have you come to take me hunting?' he asked."



Orossing the Channel in a Gale.

'THIS LITTLE WORLD.'

SOME PORTRAITS OF GREAT BRITAIN. Drawn by J. A. SYMINGTON.

(Continued from page 54.)

DEAL (population 12,998) is a pleasant old place lying behind the Goodwin Sands. The Deal pilots and the Deal life-boat are famous, and 'all in the Downs' of the little port the English fleet has often been moored. The town is a 'member' of the Cinque Port of Sandwich, and the Lord Warden of the Cinque Ports (for which see under Dover) has an official residence at Walmer Castle, a few miles away. Perkin Warbeck landed at Deal in 1495, and Henry VIII. built the still-standing castle in 1539 for coast-defence.

DEPTFORD is now really part of London. Its population in 1911 was 110,122, and at the present time the inhabitants are swallowed up in the general life of London, the chief industry being that of the City cattle market. In former days it saw great scenes. Here was the Royal Dockyard (see the notes on the family of Pett, under Chatham). Here, on April 4th, 1581, Queen Elizabeth knighted on the deck of her own ship (The Golden Hind) the first commander to sail round the whole world and come back alive-Sir Francis Drake. At Deptford Christopher Marlowe met his death. Here, too, was the stately mansion of John Evelyn, the diarist (see p. 58)-Sayes Court. Walking near his house in 1671, Evelyn discovered working in a lonely cottage the greatest of English wood-carvers, Grinling Gibbons, whose beautiful work in lime-wood adorns St. Paul's Cathedral. Twenty-six years later Peter the Great, Tsar of Russia, was learning the craft of a shipwright in Deptford Dockyard, working as a common sailor, but

living at Evelyn's house. It is hard to recall such scenes when we look at the swarming Deptford of to-day.

Dover (population 39,995), the English port nearest to France, has had from that geographical fact very great importance all through history. It contains a Roman lighthouse (the Pharos in the Castle), and part of a Roman church. The Roman road (Watling Street, probably a much older track re-made) begins here. The Priory (the ruins of which, including Norman work, are now part of Dover College, founded in 1870) was established in 1130. The Castle is in the main Norman. The town is the chief Cinque Port. Hubert de Burgh held the castle under King John. Shakespeare knew the great cliff now named after him-in his days probably higher than now, for much has fallen. The system of Martello Towers, built to repel Napoleon's threatened invasion, centred in Dover. Dickens made David Copperfield's forlorn tramp from London end here at Betsy Trotwood's little house. Dover was the headquarters of the great Zeebrugge raid on St. George's Day, 1918, and the bell from the Zeebrugge mole was presented to the town by the King of the Belgians in memory of that feat. The first shell dropped from the air on English soil fell on Dover. Few sovereigns or great persons journeying to or from Southern and Central Europe but have not passed through this famous port. It is an epitome of English history.

(Continued on page 67.)

MY DIARY.

Written and Illustrated by RUTH COBB.

III.-THE COUNTRY GENTLEMAN'S DIARY.

A GENTLEMAN living in the country in the seventeenth century probably had much leisure for such occupation as the writing of diaries. Quite a number of these diaries have come to light, and many more must have existed. One of the greatest of the diaries of this period is that of John Evelyn, a country gentleman, who lived through the reigns of Charles I., James I., the Protectorate, Charles II., James II., and William and Mary, and was

a friend of most of these monarchs, although not an official at Court.

It was the custom in those days for young men of good position when they grew up to make what was called the Grand Tour and to visit foreign lands. Some kept diaries dealing only with their travels. Sir William Brereton, for instance, of Handsforth, in Cheshire, went abroad in 1634, when he was twenty years old, and wrote a diary of the time he passed in Holland and in the north

of England and Scotland, some days making entries of several pages. He describes what he saw, the agriculture and the weather, and the inns he stayed at. He took a prominent part fighting for the Parliament in the Civil War. Of this we have no account. Possibly, as he grew older and his travels were finished, he may have had little time for diary writing,

or the rest may have been lost.

Another country gentleman—Adam Eyre, who lived in Yorkshire, also fought on the same side in the Civil War. Afterwards, he settled down to rural occupations. For two years (1646 to 1648) he kept a daily diary, which he calls 'A Dyurnal (Journal) or Catalogue of all my actions and expenses from the 1st Jan. 1646.' Much of it is just a list of expenses, but there are many personal details as well—such as: 'I stayed at home all day and in the afternoon cut a corne which put me to extraordinary trouble'; or the record of the first time that he smoked. Smoking was only then becoming a common practice, and so the beginning was an important event.

Henry Newcombe, a country parson who lived in Gansforth, in Cheshire, was constantly making resolutions to smoke less, as it always made him ill, and yet he again and again fell a victim to 'this base tobacco,' as he calls it. Newcombe rode about on horseback to visit his parishioners. He was constantly tumbling off or being run away with, or being nearly drowned in a flood. He and his whole family seem to have continually suffered from tumbles and accidents. 'Jan: 27th Wed. 1658.—By the carelessness of a servant my little boy Peter had a dangerous fall off the dresser.' His daughter Rose sat dressing before the fire when a brickbat was dislodged in another chimney by a sweep, with dire results. He suffered anxiety on Shrove Tuesday, when shooting at cocks was the custom, in case the little boys should be hurt, and was alarmed when they arrived home with arrows through their hats.

We miss such intimate accounts in the diary of John Evelyn, but we get to know much about other people, and his two great interests, even in his boyish days—'gardens, and curiosities.' He was born at Watton House, near Dorking, in 1620. After leaving Oxford he travelled abroad. When he was twenty-one the Civil War broke out. He seems to have taken but little part in it, although his sympathies were on the King's side. He decided 'it was impracticable for

him to stay in his disturbed native land,' and obtained special license from the King to travel again. He began his Diary in 1640, and continued it till within a month of his death. Until 1650 it is chiefly concerned with his doings abroad, his travels in France and Italy. He stayed constantly with a friend—Sir Richard Browne, the British resident in Paris—'with whose family' (he says) 'I had contracted a great friendship, and particularly set my affections on the daughter.' Mary Browne was then fifteen years old, and he was married to her on June 27th, 1647. It was at his father-in-law's house, Sayes Court, at Deptford, in Kent, that he lived for forty years, after which he returned again to Watton. On 17th January, 1653, he began his beloved garden. 'I began to set out the oval garden at Sayes Court, which was before a rude orchard without any hedge except the hither holly hedge. . . . This was the beginning of all the succeeding gardens, walks, groves, enclosures, and plantations there.'

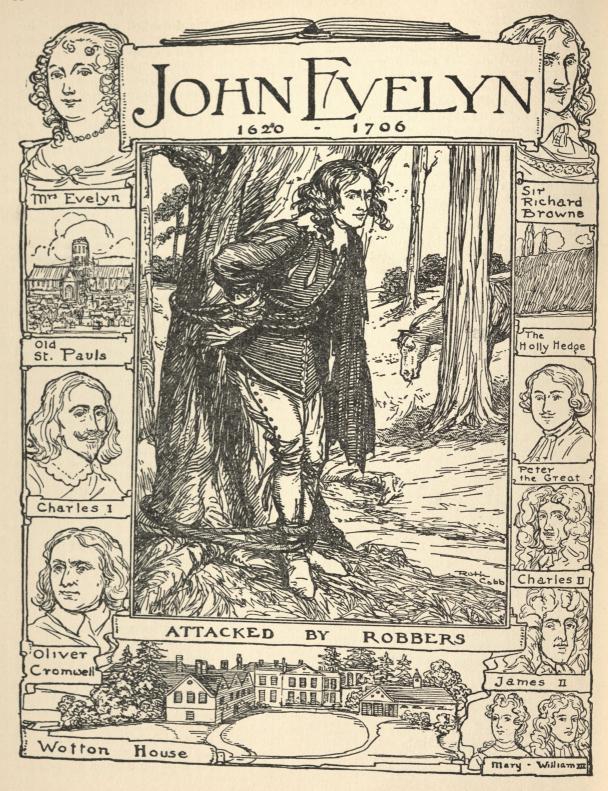
The famous holly hedge was afterwards injured when the house was let for a time to Peter the Great, the Czar of Russia, who had himself wheeled by a servant through the

hedge and over the flower-beds.

John Evelyn had one exciting adventure: he was attacked by robbers on Bromley Heath. They tied him to a tree, after taking his money, his rings and shoe buckles, unbridled his horse, and then left him. After being tormented for two hours by flies and the sun: 'I got my hands palm to palm, having been tied back to back, and then it was long before I could slip the cord over my wrists to my thumb which at last I did.'

It was Evelyn who first discovered Grinling Gibbons, the famous wood-carver. 'By mere accident as I was walking near a poor solitary thatched house in a field near Sayes Court, looking in at the window, I perceived him carving that large cartoon of Tintoretto. I questioned him why he worked in such an obscure and lonesome place. He told me it was that he might apply himself to his profession without interruption, and wondered not a little how I had found him out.' Evelyn introduced the carver to King Charles II., for whom Gibbons did so much of his famous work.

The great frost of 1634, when the Thames was frozen, and the ice was so thick that streets of booths were built upon it, is fully





Evelyn finds Grinling Gibbons at work at Deptford.

described, with its various shows. Evelyn had ever a weakness for shows, and delighted in such things as giants, bearded women, and dogs with five legs, and other uncanny sights.

Evelyn was a friend of Pepys, whose Diary, kept for eight years, covers some of the same period. Pepys calls him 'a very fine gentleman,' and, after visiting him at Sayes Court,



The Frost Fair on the Thames.

enters: 'He read to me very much also of his discourse, he hath been many years about, and now is about gardenage which will be a noble pleasant piece. He read me part of a play or two of his making, very good, but not as he conceits them I think to be.'

Evelyn wrote books on gardens and trees, and was interested in many kinds of arts and mechanical devices, and practised engraving himself. The last entry in the Diary was made only a month before his death, when he was already stricken with illness. The two manuscript volumes were kept by his descendants until 1818, when they were printed.

Customs in England had changed but little, when in 1704, Sir Justman Isham, of Lamport, began his diary, two years before the death of John Evelyn. He went the Grand Tour, visiting much the same countries of Europe, and seeing some of the same sights. He still kept a diary on his return. He writes constantly of the dangers of the road, both from the roughness of the roads, for the coach was constantly overturned, and from highwaymen. He also was set upon, and had his portmanteau opened, all his linen, gold watch and money taken. He attended the Court of Queen Anne and stood for Parliament. For polling: 'Four booths were erected on Market Hill and two outside the town on account of prevalence of small pox.' From this group of diaries, all written about the same time, we are able to picture the life at home and abroad, with its many every-day interest, of the country gentleman of the seventeenth century.

BOB.

N our garden here we have so many friends in the birds, that it is a very happy place to go into. Especially is this the case when we work among the flowers, for then they flock around us, in the hope of picking up some grubs or worms. I must tell you about 'Bob.' Every morning when I go out to do some weeding or watering, 'Bob,' in the shape of a very fat, comfortable-looking Robin, his breast glowing as red as a cherry, alights on my shoulder. He gives me quite a condescending little bow, as if he were saying: 'Yes, this is my garden as well as yours, so I will take you all round it.' He goes wherever I go, and takes crumbs out of my hand at the same time. He is so tame that he shows not the slightest fear of me, and one morning he even introduced me to his four little ones. It was most ridiculous to see the wee, newly-fledged things hopping here, there, and everywhere.

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' The Hidden City,' Princess Ooma,' &c. Illustrated by E. S. FARMER.

(Continued from page 55.)

CHAPTER VII.
THE DEAD AND THE LIVING.

To Lulu the next day seemed the longest she had known. She could not go hunting nor fishing to pass the time, for no one, except the man upon whom the lot had fallen, was allowed to leave the settlement until Zend was buried.

'When the earth has been heaped over Zend, the new chief will lead the whole tribe on a hunting expedition,' Bobo explained. 'Partly to show that he can lead, partly to put them in a good temper. The game must not be disturbed in the interval, that the killing may be the bigger. I remember Zend's hunt well. It was a great hunt. There was a huge stag that half-a-dozen of us pulled down when it was wounded. Dilda and I were given the

tongue; it was very good.'

'Ah!' sighed Brild regretfully. He, too, had been listening, and licked his lips as he thought of the gorgeous feast in which he could not remember having shared. But he was still very well content. His first thought on waking had been of Churruk, and the rewards that, no doubt, would be bestowed on himself. He might surely hope for many a titbit in return for his revelations. He would go to Churruk now, he decided. He had waited until the day was warm enough to be pleasant. He would watch from a discreet distance and again choose his moment. But, so absorbed was he, that he came upon the new chief unexpectedly. Churruk was selecting a sapling, from which to make a bow, at the forest edge. He reached out a hand and gripped Brild by the neck of his skin tunic, lifted him in the air, and dropped him, sprawling on hands and knees.

'Well? What news?' he questioned roughly. Great news,' Brild asserted as he righted himself cautiously, devoutly thankful he had not come empty-handed.

'Be quick,' Churruk warned. And at that,

Brild, flustered, plunged into his tale.

'I followed Lulu last night. I was very brave. I followed her to Zend's hut,' he gabbled. 'I hid underneath. She went inside. She talked to Ullah. Lulu and Zip-Zip are going to hide Zan. I heard her say it.'

'Zan?' Churruk echoed. It evidently had not occurred to him that any one could defy him thus.

'A little while before Zend is buried. They will run away with him just before dawn to stop you killing him,' Brild finished triumphantly, for Churruk was undoubtedly impressed. But a moment later, Brild was gasping,

appalled.

Before the dawn? Churruk was saying. Then see you are there to watch. I cannot leave this place till Zend is buried. Follow until you are sure of their direction. Then come back to guide me, or I shall kill you instead of Zan.

Already he had turned away to look for a sapling again. Completely cowed, Brild stole

off.

Lulu had by, this time given Zip-Zip her final instructions, and was looking at Zend's

grave which had just been finished.

It was deep and wide. One end shelved, making a passage-way down which Zend could be carried at the appointed time. At the bottom was a bed of rushes. Food and water had been placed beside it already, and also the weapons at which Lulu looked again with covetous eyes. She had thought, vaguely, she would only have to deal with Ullah did she try to gain possession of them. To snatch Zend's belongings from him where they lay awaiting him seemed a more direct challenge.

'Why isn't the hole left empty until morning?' she asked Bobo, so indignantly that

he looked at her mildly surprised.

'Zend must find everything ready when he arrives,' Bobo explained. 'He must feel himself a welcome guest.'

'But the wild things may steal the meat in

the night,' Lulu objected.

'They never do,' Bobo told her. 'Perhaps the spirit is hovering near and drives them away. Or perhaps they think a hole so newly dug and deep must be a trap. Now, Lulu, you may watch me if you keep quiet and don't worry me. I am going to begin my marvellous necklace.'

Lulu accepted the invitation and sat beside her uncle for most of the day. It was quite a good way of passing the time, and she could snatch a little sleep at intervals; she would not have much that night probably. But presently, because she liked to have a finger in every pie, she picked up an old tool of Bobo's and began to hack at a bit of wood until he mocked at her.

'What are you doing? What do you think you are making?' he jeered. 'A toy for a baby? It is fit for nothing better, and you my niece.'

'Yes, a toy for a baby,' Lulu agreed unexpectedly. She would make a toy for Zan. He might like it. She chopped and hewed industriously until she had made a fish of kinds. It was also an excuse for lingering, so that she was the last to go inside the hut that night. It was she who fastened the curtain, and took care not to push the pegs too deep into their sockets.

And now that the moment was so near when the great adventure would begin, Lulu's heart was beating fast with excitement. She had kept tranquil hitherto, reserving her strength. But it always pleased her to pit her skill against heavy odds; it made the winning so well worth while. A little pulse in her throat was beating fast as she lay listening for the moment when she could be sure that Bobo, Brild, and Dilda were asleep.

Lulu's hand closed upon her spear; she had placed it close by in readiness. Her sling was already round her waist. She began to worm her way towards the door, and could hear the faintest stir as Zip-Zip followed. Then they were both outside and looking at the stars. Though the waiting time had seemed long, the dawn was still distant. The moon, almost full, shone upon the mound of earth by the open grave. Lulu's eyes turned next in that direction; it drew her irresistibly.

As she crawled towards the hut door, she had told herself again how useful Zend's weapons would be, and for an added reason. Zip-Zip could be armed with the old spear and sling if she herself were more suitably equipped. Keyed up to a pitch where anything seemed possible, she turned abruptly to Zip-Zip.

'Stay here,' she ordered, and was off. Alone she could run faster, and do what she had to do more surely. A moment she paused at the edge of the grave to sniff. Certainly it did smell like a trap. She shut her eyes as she plunged down the incline, but had to open them to search for what she needed.

She looked around again at all the preparations made for Zend on which she had looked down that afternoon. And all at once she was afraid no longer; something akin to pity ousted fear. Never again would Zend track and hunt in the surrounding forests; never again would he swim in the cool river pool and spear salmon in friendly company. He must wander alone, forlorn.

'I'm sorry, Zend!' Lulu whispered.

She found the spear and sling and climbed once more to the ground level, but now slowly. Zip-Zip watched her strolling towards the fire with growing surprise.

'But weren't you frightened? Was there nothing dreadful there?' Zip-Zip asked, amazed.

'Nothing,' said Lulu. She had thrown off her vague depression. Her spirits were rising again already. She tip-toed, dancing, round the fire; then she flung herself beside Zip-Zip.

'There! That's done!' said Lulu casually. 'We'll fill a fire-pot presently, and make the salmon into two packs. I won't go for Zan yet awhile. He'd be a nuisance if I fetched him too soon.'

(Continued on page 70.)

AN EASTER SURPRISE.

FANCY! a Good Friday without hot cross buns, said Hilda.

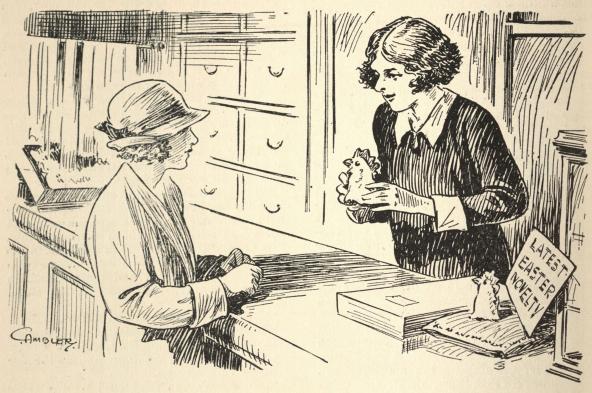
'And I don't expect we'll have boiled eggs to-morrow, Easter Sunday,' remarked Eric. 'Mummy said Granny was forgetful, but I never thought any one could be so forgetful as that!'

Hilda's voice sounded quite choky as she said, 'It's horrid Mum and Dad being away for Easter!'

Eric must have heard the choke in it, for he said briskly, 'Cheer up! We've come out to go shopping, you know. And we haven't decided yet what to buy Mum and Dad.'

Neither they had! And they seemed no nearer a decision when they had talked together for a few minutes.

'I know,' said Eric at last, 'we'll part. You can stop this side of the road and I'll go the other, and you buy Mum's present and I'll buy



"The egg-cosies were hand work, and cost one and threepence each."

Dad's. It'll be exciting afterwards seeing what we each have bought. Then let's hurry home and do up the parcels, for if they don't go to the post this morning, I'm sure they won't get there in time!'

Eric rushed across the road and left Hilda, still feeling very low-spirited, by a fancywork shop, where they had stopped to talk. Hilda looked into the window without seeing anything for a time-she was too busy wondering when Dad would be well enough to return.

The children's father had been ill, and the doctor had suggested that he should go to the sea for a week or so, and Mummy had taken him. Meanwhile, their granny had come to keep house for Hilda and Eric. She was a dear old lady, but like a good many old people, very absent-minded. And she had actually forgotten to order any hot cross buns for Good Friday!

Look, that's a nice little egg-cosy !

'Yes, very nice!'

Two ladies had come up behind Hilda and were admiring an egg-cosy which was hanging from a brass-rail.

Yes, it was pretty, thought Hilda, and it suddenly struck her that it would be the very thing to buy Mother for a present.

She dived into the door-way, and was soon being served. The egg-cosies were hand work and cost one and threepence each, the assistant told her. Hilda and Eric had saved five shillings between them for Mum's and Dad's Easter presents, which meant that each had two shillings and sixpence to spend. So Hilda was able to buy two egg-cosies.

She watched while they were being wrapped up in tissue paper. The egg-cosies were shaped like chicken's heads, and made of red and white flannel-red for the comb, with two black boot-buttons sewn in for eyes.

They were certainly a novelty, and Hilda felt very pleased with her purchase as she marched out of the shop.

(Concluded on page 66.)



... Wherever did you get this?'"

AN EASTER SURPRISE.

(Concluded from page 64.)

HILDA crossed the road to see if she could see any sign of Eric, and caught sight of him peering into the window of an antique shop.

'Look!' she cried, running up, 'egg-cosies,' and she unrolled the tissue paper and showed

what she had bought.

'Splendid,' said Eric, poking one on the tip of his finger, 'Mum'll like those I was looking at that egg,' he added, 'I was wondering if Dad would care to have that for his collection!'

'Why, of course he would!' said Hilda.
'I've never seen such a large egg before. It
must be something special Do go in and ask

the price . . .

'Got it!' said Eric, a minute later, as he came out, bearing the precious egg in a cardboard box. 'Such a funny old man served me—asked how much I had got; and when I said half-a-crown, said I could have the egg for that. Says it may be the egg of a dinny-something, an animal that lived millions of years ago. Anyhow, Dad'll know!'

'Sure to,' said Hilda. 'I do think we've been lucky,' and she fondly fingered the little

tissue-paper packet in her hand.

Granny was upstairs when the children got in, so they did not show her their purchases, but set about parcelling them up at once.

Then Granny came down dressed to go out. 'If you two'll mind the house while I'm gone, I'll do a little shopping,' she said.

Hilda glanced ruefully at Eric. Eric knew what she was thinking about—their parcels.

'Granny'll post them,' he said. 'You don't mind, do you, Granny,' he asked, 'taking two parcels for us for Mum and Dad to the post-office? Oh, dear, the postage money . . . !' Neither of them had thought of that!

'Don't worry,' said Granny, sweetly, 'my purse will stand that,' and the children thanked

her very much.

Granny came back with her shopping-basket overbrimming, and at tea-time there appeared

on the table a lovely Easter cake.

'I thought we would cut the Easter cake beforehand, in case I forgot all about it as I did the buns,' said Granny, smiling. Then, 'Dearie me!' she said suddenly, 'and now if I haven't forgotten all about posting your parcels!'

'Oh!' cried Eric and Hilda, looking blankly

at one another. Then when they saw how upset Granny was, they bravely tried to hide their disappointment.

'Perhaps the parcels wouldn't have reached them in time anyhow,' Eric said. 'At Clacton they might not have a Sunday post as we do. They were little Easter presents we were sending them, Granny,' he explained.

Then he and Hilda started talking about something else, for they could see that Granny

still felt very bad about it.

After tea a lovely surprise was in store for them. A wire came, saying that Daddy and Mummy were returning that night.

'Hurrah!' shouted Eric. 'What a good thing you didn't post the parcels, Granny!'

It was splendid to see Mummy and Daddy again—and Daddy looking so well, too. But there was not much time for talking that night, as it was long past Eric and Hilda's bed-time when they arrived.

'Granny says the presents are in the bottom of the shopping basket,' Eric whispered to Hilda on the landing just before they went to bed. 'Whoever's down first mustn't forget to

put them on their plates . . . '

Oh, the excitement of that Easter morning! Hilda and Eric each found a ten-shilling note under their egg-cups, given by Mummy and Daddy, and a lovely chocolate egg on their plates from Granny—who was not so very forgetful after all!

But the children's chief excitement was in watching Daddy and Mummy undo the parcels

they had given them.

'Wherever did you get this?' said Daddy, his voice almost trembling as he lifted out the great egg from its box . . . 'It's a'

'Dinny-something, the man said,' Eric burst

out.

'Dinosaur's egg, the man's right,' said Daddy.
'And it's very valuable . . . What a good thing the parcels weren't posted!' he added, echoing Eric's words of the night before. He had heard how Granny had been given them to post and had forgotten. 'I wouldn't have entrusted this through the post for the world—it might have got smashed Fancy finding me a dinosaur's egg! Well, you are clever children!'

And Mummy was just as pleased with her present. She said she had always meant to

LIBRARY

buy some egg-cosies, but was quite sure she would never have found anything so pretty and novel as Hilda's choice. Hilda must show her the shop where she bought them, she said, so that she could get one or two more to make a set.

The only thing the children could not help feeling regretful about was that they had no present for Granny. But Granny didn't mind, bless them, she said. She could not have wished for anything better than the pretty Easter card they had given her. They had remembered to buy this a week ago, and had put it on her plate that morning.

'And we thought it was going to be a rotten Easter,' Eric and Hilda said afterwards. 'Instead of that, it's the best we've ever had.'

HILDA REDWAY.

'THIS LITTLE WORLD.'

SOME PORTRAITS OF GREAT BRITAIN. Drawn by J. A. SYMINGTON.

(Continued from page 58.)

THE CINQUE (5) PORTS were originally
Dover Sandwich Hytho and (Now) Port Dover, Sandwich, Hythe, and (New) Romnev in Kent, and Hastings in Sussex. To these were added the 'Ancient Towns' of Winchelsea and Rye. The Ports were a string of naval bases to guard against invasion from Europe; and they were probably united for that purpose as soon as late Roman times, under the Count of the Saxon Shore, to repel the Saxon invaders. William the Conqueror reorganised them, and under the Norman and Plantagenet kings they were very important, for their ships were the forerunners of the Royal Navy. On condition that they furnished the king with ships, they were given privileges which made them almost self-governing under their Lord

The Cinque Ports still retain some of their old rights—one is to bear a canopy over the sovereign's head when he goes to be crowned at Westminster: this was done by the 'barons' (chief freemen) of the Ports, and jurats (sworn men: much the same as aldermen) at King George's Coronation. They still hold at intervals their Court of Brotherhood and Guestling, which once met regularly to settle their rates and duties; it is now only a survival. It was held in recent years at Dover's Maison Dieuthe fine building erected by Hubert de Burgh as a hospital and poorhouse. They still hold also (as a ceremony only) their ancient 'Court of Shepway'-an extinct place, probably near Lympne, where their law-suits were once tried. They keep their ancient uniforms and insignia. Their arms are shown on the map.

To the seven original Ports were added members or 'limbs.' Most of the larger places in Kent, and many in Sussex, were fully incorporated members—Folkestone, Deal, Faversham, Lydd; Faversham, for instance. Their burgesses had all the Cinque Ports' privileges. There was also a very large number of smaller places, linked up but not incorporated. But the changes in the coast line—Dover to-day is the only real harbour left of them all—and the foundation of the Royal Navy itself by Henry VII. at last took away their independent life and national importance.

DOWNE (population 791) is a pretty village in the north-west of Kent, famous as the house of Charles Darwin, the great scientist who, with Alfred Russell Wallace, gave the theory of evolution to England; he died there in 1882.

Dungeness (or Dengeness) is a promontory which, unlike many places on the Kent coast, is gaining land from the sea—a mile or so within the last fifty or sixty years. There is a very dangerous 'race' round it, and there have been many shipwrecks there. For the Kent coast generally, see under Forelands, North and South.

EBBSFLEET (between Ramsgate and Sandwich) was the spot at which St. Augustine landed in 597 to establish Christianity in Kent and England. It is said that in the previous century Hengist and Horsa also landed here—the leaders of the Jutes who were to populate Kent and the Isle of Wight.

FAVERSHAM (population 10,816), on the river Swale, has a greater history than its prosperous peace of to-day might suggest. In 812, when Athelstan was king, it was, according to a charter, 'the King's little town of Fafresham.' In 1147, King Stephen built an abbey there, and in it he and his Queen



Charles Darwin's House at Downe.

Matilda were buried. Henry VIII., Queen Elizabeth, and Charles II. all visited the town, which is a 'limb' of the Cinque Port of Dover (see above). A noted and terrible tragedy took place there in 1655, when the younger son of George Sondes, Earl of Faversham, killed his brother at Lees Court and was hanged for it. It had also been the scene of another tragedy a hundred years before, when in 1551 Arden of Faversham was murdered at the instigation of his wife. This became the subject of a play often said to be by Shakespeare, but almost certainly not by him.

To-day the town has some manufactures, but is chiefly concerned with the oyster fisheries and the hop-growing country around.

FOLKESTONE (population 37,535) is a 'limb' of the Cinque Port of Dover, and a flourishing port independently of that fact. Many thousands of British soldiers left here for France during the Great War. The old town is very picturesque; the fine parish church dates from 1137. The earthworks behind the town (where the North Downs begin), called 'Cæsar's Camp,' is probably the remains of a Norman Castle; William the Conqueror, after the victory of Hastings, hurried to Folkestone and Dover to secure his flank before he marched to London.

William Harvey, the discoverer of the

circulation of the blood, was born here in 1578, and there is a fine statue to him on the Leas.

GAD'S HILL, near Rochester, is famous as the scene of Sir John Falstaff's supposed victory over robbers (in Shakespeare's *Henry IV.*, Part I.), and as the residence for many years of Charles Dickens (see under STAPLEHURST).

The GIRDER LIGHT SHIP. See the NORTH FORELAND, under which heading the coast-line of Kent is treated generally.

GRAVESEND (population 31,171) is practically one with Northfleer (population 15,720). It is a very old town, being mentioned in Domesday Book: its natural position at the very entry into London, opposite the equally well-placed Tilbury in Essex, has made it always important. All ships outward bound ('going foreign') from London must take on board a pilot here, and inward-bound ships pick up Custom House officers—'tide waiters,' they used to be called. Most of the Elizabethan voyagers—Frobisher and Sebastian Cabotamong them—touched here on their way out to find new lands. The late Queen Alexandra landed here, and was welcomed by the young ladies of



Gadshill Place, the home of Charles Dickens.

Kent, when she came to England in 1863 to marry the Prince of Wales, afterwards Edward VII. Rosherville Gardens (founded by Jeremiah Rosher) lay between Northfleet and Gravesend, and were a popular pleasure resort till recently.



William Harvey.

GREENWICH (population 67,315). like Deptford and Woolwich, has now been almost swallowed up by London, but it has a remarkable history and a character of its own. Here, at the great Observatory in Greenwich Park, the time is set daily for Great Britain—'Greenwich Time.' The Danes encamped here in 1012, after capturing Canterbury. Henry VIII., Queen Mary I., and Queen Elizabeth were all born in Greenwich Palace. The fine buildings of the Hospital (now the Royal Naval College), founded by William and Mary and designed by Wren, are a wonderful sight from the river, and contain a splendid Naval Museum. The Painted Hall holds many Nelson relics.

An old custom, in the days when the Thames was more used for London passenger traffic than it is now, was to go to the Ship Hotel for whitebait dinners: Members of Parliament and others frequently made up parties for this purpose. Greenwich Fair, held in the Park, was also a popular institution.

The view over London from the Hill, in spite of modern changes, is still very fine, particularly early on a clear morning.

HEVER (population 718) is famous for its castle, the birthplace of Queen Ann Bullen or Boleyn, whose father, Sir Thomas, is buried in the village church. Henry VIII. came here to court the queen he beheaded a few years later. She was the mother of Queen Elizabeth. The

castle was first built in 1275, but most of the present building—fully restored a few years ago by the first Lord Astor—is of a slightly later date.

HYTHE (population 7767) is a very ancient Cinque Port from which the sea has largely receded, and a pleasant summer resort. The fine old church of St. Leonard's contains in its 'crypt' a grim exhibit—1100 skulls and a still greater number of bones. It is thought they are those of men who fell in battle, but when and where is not known.

Close to Hythe is the great modern camp of Shorncliffe, and the two very old villages of LYMPNE (population 592) and SALTWOOD (population 861). Lympne (pronounced Lim) has a history running from at least Roman times—it was the Roman Portus Lemanus, being then on the sea—to the aerodrome of to-day, and to political conferences in the castle during the Great War. Remains of the old Roman castle can still be seen, but that in use at present dates from the time of Henry V. The Court of Shepway (see Dover) met here, and it may be the site of that lost place. Saltwood Castle also dates from the earliest days, though it was probably rebuilt many times. It is said that Becket's assassins met here to make their plans for murdering the Archbishop. The present building was erected about 1382.

IGHTHAM (population 1596) is the Saxon 'place of the eyot (island),' but it was inhabited before ever the Saxons came. Mr. Benjamin Harrison, of the pretty village, found on Oldbury Hill, close by, an enormous collection of Stone Age implements—so fine that no historian of our earliest fathers can neglect them. Mr. Harrison, a village tradesman, was one of the finest examples of what a man eager for knowledge of the place where he lives can give to the history of all mankind.

Ightham Mote is one of the most perfectly preserved and beautiful private houses of the fourteenth century in England. It is mostly of Kentish ragstone, and is surrounded by a moat. It was built about 1340.

Keston (population 1029) contains in Holwood Park (the home of William Pitt) the remains of a Celtic earthwork; it also has remnants of a Roman villa and tomb. In the Park is a seat recording the fact that there

William Wilberforce first discussed with Pitt the possible abolition of the slave trade. The beautiful Common covers many acres, and with the adjoining Hayes Common, is one of outer London's best open spaces.

Lydd (population 2256), a member of the Cinque Port of Romney, has a handsome church with a fine tower which can be seen far and wide. Its chief fame to-day comes from the terrible explosive named after it and first made there—lyddite, invented about 1886.

(Continued on page 99.)

DRESSING UP.

CROSS a little gipsy's palm with silver, pretty lady;

I'm the little gipsy girl that drives the caravan; Let the little gipsy tell your fortune, pretty lady; Toss me down a silver coin and get what news you can.'

Let me take a peep beneath your kerchief, pretty

Let me tell the fortune of the gipsy maid instead; Seven strokes are chiming—in a twinkling, pretty

Somebody will come to take my gipsy girl to bed.'

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. FARMER.

(Continued from page 63.)

CHAPTER VIII. FLIGHT BY NIGHT.

Now,' said Lulu, looking at the sky critically again. 'Now I think I can go for Zan.'

It was a little later than she had intended. She and Zip-Zip had lingered by the fire until it was perilously close to dawn. But in truth neither was over-eager to leave the settlement till the sun had almost risen. Brild's fears had had a very real foundation. The beasts that fed at night, and infested the forest during the night hours, were far bolder than the day feeders. And so many of them relished meat in any form, animal or human. Lulu and Zip-Zip had to reckon also with the fact that their foo falls would be multiplied by three; and Zan was still so young and inexperienced that he must inevitably attract attention.

Zip-Zip helped Lulu adjust her pack, slipped her own across her shoulders, and carrying the fire-pot, followed to Zend's hut. She might not, possibly, have ventured close to it earlier. But, since Lulu had returned from the grave itself unharmed, Zip-Zip was convinced that luck was with them. She squatted down to wait as Lulu reached towards the hut curtain. Before she could lift it, it was pushed aside and Ullah looked out. From where Zip-Zip sat she could not see Ullah's face very well, but there was something in her attitude that was not reassuring, and of Zan there was no sign, and no sound came from within the hut.

'There's going to be trouble,' thought Zip-Zip, dismayed.

Lulu had sensed an atmosphere of trouble also, and with equal dismay. Ullah had been

so reasonable on the previous night, it had not seemed necessary to reckon on delay at this point; she certainly had not allowed for it. Should she push past Ullah into the hut, snatch up Zan and make off with him? But she remembered, too well, a day when she had pounced on a wild kitten she wanted to keep and tame. Its mother had attacked her so ferociously she had had to run, leaving the kitten behind. Ullah reminded her unpleasantly of that cat. Lulu edged a little closer, but cautiously.

'I have come for Zan,' she ventured.

'Go away,' Ullah flung back immediately.
'You shall not have him.'

'But you yourself told me to come just before dawn,' Lulu recalled with rising impatience. 'It's nearly dawn now. It will be light very soon. We must go quickly.'

'I was mad last night,' Ullah answered gloomily. 'After you left I knew it.' She shivered as she spoke, and looked backwards over her shoulder as though to make sure Zan was still there.

'It's now that you're mad,' Lulu assured her.
'Do you think I want to save Zan to amuse myself?'

But Ullah hardly seemed to hear, she was

still shivering.

'If I could go with him,' she said, half to herself and half aloud. 'But I dare not desert Zend now; I, who am his widow, and must therefore break his skull to set his spirit free.'

Profoundly interested, Lulu listened. Here then was the explanation of the fact that Ullah had not insisted earlier on accompanying them. Certainly she herself was missing much by running away with Zan. But, when Churruk was buried on her return, she would see that no ceremony was omitted that was a chief's due, so that she might witness them all. And, thus reminded that first Zan must escape, she ducked under Ullah's outstretched arm, poked her head into the hut and called to the child. He might, after all, prove easier to manage than the kitten.

'I have come for you, Zan, I am waiting,' she urged. Then saw, to her relief, that Zan was close to her; almost touching her, indeed. His bow was slung across his shoulder; his quiver, full of arrows, in one hand. But, ere she could catch him by the other, Ullah had pulled the boy out of the hut, and caught him close to her.

'He shall not go,' she repeated. 'I tell you he shall not.'

For a moment Zan stood passive in his mother's embrace. A little angry still with Lulu for thwarting him the night before, he was in fact inclined to make a favour of his going. Yet, at the same time, he was tingling to be off; he had picked up his bow and arrows at her first whisper. He had been listening, tense, to every word of the conversation. It needed but a touch to set him struggling though he glowered at Lulu, as she, now thoroughly angry, glowered at him.

Stay!' she flung at him. 'Stay, little baby, with your mother. Look. I have your father's spear. I have his sling. I might have given them to you some day when I had taught you how to hunt.' She paused for breath, and flourished the spear until the moon's rays caught it. She heard Ullah gasp, and saw Zan strain forward eagerly; and suddenly she guessed that

victory was near.

'But not now, little coward. Not now,' she taunted. And, at that, Zan burst from his mother's arms and clutched at her.

'Run!' he said, shortly.

Zip-Zip was on her feet already. With Zan between them, she and Lulu raced towards the forest, while Ullah, taken by surprise, overwhelmed at sight of the spear, remained behind. Perhaps she thought Zend himself had given it to Lulu. At any rate she made no attempt to follow, but the delay she had caused had been enough to make every moment of importance.

Down the track towards the river the three went, in single file now for the track was narrow, until, as dawn broke, they reached the river brink. Into the shallows Lulu, leading, stepped immediately, and began to wade downstream,

keeping close to the bank where the current was less strong. To take the water beyond the fishing pool was absolutely necessary. Up to that point even the most experienced tracker rarely disentangled one footprint from another, so many of the tribe went and came from it. But, from thence onward, only the bolder spirits usually ventured, and a footstep on the river bank beyond stood out.

It was not easy walking in the river bed. The pebbles were sharp, and Zan kept stumbling. Lulu turned just in time to catch him as he pitched headlong. She shook him and set him upright again. Pleased that instead of objecting he merely looked at her questioningly, she

unbent a trifle.

'Water hides a trail better than anything,' she explained. 'Soon we'll climb into a tree, and wait and see what happens. If any one comes, we shall be well hidden, they won't find us; and we can watch which way they go,

and not run into danger.'

She spoke with confidence, for the victory over Ullah, the successful race through the forest, had been cheering. Lulu was beginning to think it was most unlikely there would be any pursuit at all. How could any one guess that she and Zip-Zip had helped Zan to escape? It might easily be supposed that they two had gone off to hunt in despite of orders, and that Zan, scared by something he had heard, had run away alone. In which case why should any one trouble to look for him, as his death could be only a question of hours? She and Zip-Zip had never taken the child with them before, and surely Ullah could concoct a likely tale to help him?

But she could not afford to be less than cautious as yet, Lulu knew. Already she was looking for a suitable tree. There were plenty. Thickly leaved, arching trees with branches hanging low across the water. There was an oak from which the spot where they themselves had emerged from the forest was visible. The river had bent at an angle and the main part of the tree was hidden round it. But, from the end of a large bough, a good view could be obtained.

'Up you go,' she told Zan, and hoisted him in the air until he had a good grip. He climbed well, she noted with approval, despite the fact that his calves and ankles were bruised. She followed to the bough she had chosen, bade Zan seat himself and crept past him, leaving Zip-Zip between the child and the trunk.

(Continued on page 74.)



". Stay, little baby, with your mother."



"They looked at him suspiciously and asked who he was,"

A FUGITIVE FROM CULLODEN.

A N old lady recently deceased, whose maiden name was Burness and whose grandfather was a first cousin of Robbie Burns, Scotland's national bard, had an ancestor who was an officer and fought for bonnie Prince Charlie.

After the battle of Culloden Moor, when the Duke of Cumberland's dragoons were hot in pursuit of fugitives, this gentleman sought refuge in the humble cottage of a poor crofter and his

wife and asked them to shelter him from his

pursuers.

Divesting himself of his military clothes and weapons, which were hidden in a loft deep down beneath the hay, he was put to bed in the kitchen. Presently, it was reported that the dragoons were

coming.

Entering the little cottage, they found a poor fellow wrapped up in a tartan shawl with a bowl of gruel in his hand sitting up in bed. They looked at him suspiciously and asked who he was. The old woman said that it was her son and that he was consumptive. They proceeded to search the house, stabbing the hay in the loft with their swords; but, finding nobody, they went away disappointed.

The next difficulty was to get the fugitive safely out of the country. He was eventually, under a disguise, smuggled to the coast, where a vessel was in waiting for him and he sailed to

France.

Prior to his departure he sought to press a gift of several gold guinea-pieces upon his kind deliverers, but they refused to accept them not because they did not need the money, but because, if it were known that poor people like themselves had gold pieces in their possession, suspicion would be aroused, inquiries would be made, the plot would

be found out, and they would suffer both in their persons and their goods.

These were indeed stirring, exciting and dangerous times. It is good to hear of them and also to know that, in a different way, we too can help others in their time of need, and, like the Boy Scouts and Girl Guides of the Empire, do a good turn to as many people, and as often, as we are able. Every poor person and suffering creature in distress has a claim upon our sympathy. L. M. N.

FROM CHATTERBOX OF SIXTY YEARS AGO.

III.-DON'T BE COWARDS.

A BOY named Charlie Mann once smashed a large pane of glass in a druggist's shop, and he ran away at first, for he was frightened; but he began to think, 'What am I running for? It was an accident; why not turn about and tell the truth?'

No sooner thought than done. Charlie was a brave boy; he told the whole truth—how the hard ball with which he was playing slipped out of his hand, how frightened he was; how, sorry, too, at the mischief done, and how willing to pay if he had

the money.

Charlie had not the money, but he could work, and to work he went at once, in the very shop where he broke the glass. It took him a long time to pay for the large pane he had shattered, but by the time it was done he had made himself so useful to the druggist, by his fidelity and truthfulness, that he could not hear of his going away, and Charlie became his clerk.

'Ah! what a lucky day it was when I broke that

window,' Charlie used to say.

'No, Charlie,' his mother would respond, 'what a lucky day it was when you were not afraid to tell the truth.'

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. FARMER.

(Continued from page 71.)

CHAPTER IX.

A STRANGE BABY.

THE bough was broad and comfortable; for the moment there was nothing to fear, and Lulu, in consequence, relaxed yet further. She turned Zan's feet over and looked at them critically. No one can travel far, however plucky, the soles of whose feet are badly hurt, she had realised long since when hunting.

'Ullah would have rubbed them,' Zan told her gravely, as he, too, looked at his feet. They were hurting him more than a little, and his under-lip trembled as he spoke. But at once he set his teeth in it to steady it, as Zend had done when he was dying. Lulu looked at him; then she began to pass her hand up and down his aching shins.

'You do one leg; I'll do the other,' she told Zip-Zip. Both were accustomed to massage their own muscles when necessary, and knew exactly where to rub. 'You'll have to learn not to get tired so soon,' she impressed on Zan, that he might not be unduly uplifted by so much attention.

'I'm not tired, I'm not,' Zan retorted indignantly, and kicked so vigorously the three of them nearly fell into the river, and Lulu

turned on him, frowning.

'If I say you're tired, you are tired,' she warned him. 'Don't forget. Now sit here with Zip-Zip, and behave yourself. It's time I began to watch the track. If he's disobedient, push him into the river, Zip-Zip; throw him

into the deep part to drown.'

'I shouldn't drown; I can swim very well,' Zan retorted. But he was a trifle overawed by Lulu's scowl. He watched her crawl out over the stream, and then began to question Zip-Zip. He still thought they were all bound merely on a hunting expedition, and it puzzled him that Lulu should take so many precautions.

'Does she know of a very good huntingground she wants all for herself, and is some one trying to spy?' he asked, to Zip-Zip's puzzlement, since she did not know he was

unaware of his own danger.

'We are going to the place where once I lived,' she told him. 'Of course Lulu does not want any one to follow, or you might be killed after all the trouble she has taken,' Zip-

Zip explained.

'Why should I be killed?' Zan began again, still perplexed. Then suddenly he stopped to point. Something was stirring in the undergrowth not far away Lulu had seen it, too, and was edging back again. And as she reached Zan's side the bank edge crumbled, and out into the river waded the queerest thing. It was about the size of a cave bear, four-legged and hairy, in colour greyish-black, and faintly striped. It had a trunk on either side of which jutted out two long curved tusks. Despite its size, it was obviously very young, so clumsy were its limbs and cub-like. It began to drink with joyful squeaks and squeals, squirting the water first into its mouth from its trunk, and then over its back and sides.

'It's a baby mammoth,' Lulu guessed as she looked at it. As yet she had never seen a live mammoth; but Bobo, making pictures one day as he scratched and hacked, had talked of

mammoths casually.

'Once they gathered in herds,' Bobo had said; 'but that was before my father's timehis father told him. Now there are only a few, each by itself, and very fierce. If you should hear a mammoth feeding, run, Lulu, run; it will not spare you if it catches you.'

'What will it do to me?' Lulu had asked.

'It will seize you in its trunk—it's long, long trunk that reaches out far ahead of it,' Bobo had answered. 'It will pull you close, and thrust you underneath its feet. It will kneel on you; and after that there will be no more Lulu.'

'But what does it feed on? How shall I hear it? You said, "When you hear it," Lulu questioned. 'Does a mammoth make a

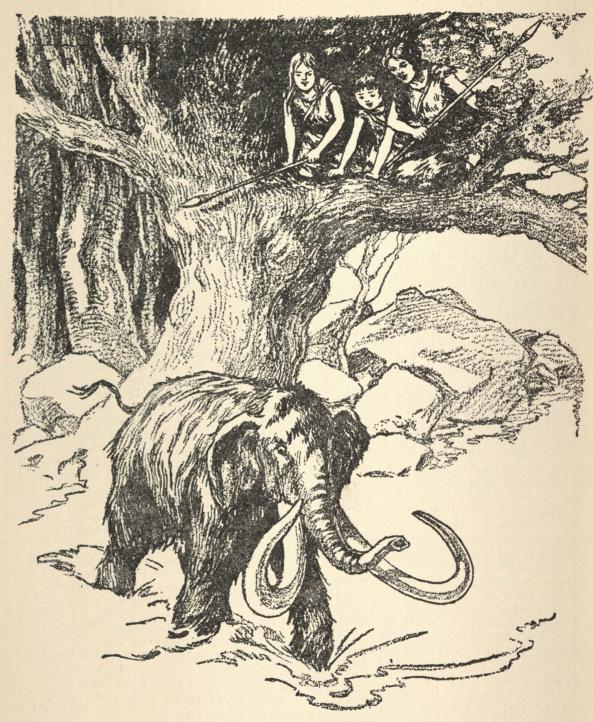
loud noise when it eats?'

'You will hear it quick enough,' Bobo assured her. 'It feeds on trees. It pulls them crashing down. Sometimes it pulls up a little tree, and holds it in its trunk, and with the branches it dusts the flies from its sides.'

All this Lulu remembered now as she looked down at the grey calf splashing in the river. It, at any rate, was too young yet to be dangerous. It was not strong enough to pull down trees. But she noticed it was not as cautious as were most wild things. It seemed aware of its coming strength already, and did not look from side to side suspiciously for a possible enemy. Now it was rolling on its back, legs in the air. Absorbed, she watched it until she remembered she was on guard, and crawled back along the branch. She was only just in time. Two figures were coming swiftly towards the pool; a moment later she had recognised both Churruk and Brild! She had been sure too soon that all was well. Yet what had made these two choose the river path? And they were not looking at the ground; they were not following a trail. Puzzled, she watched, after she had sent a warning glance to Zan and Zip-Zip, and made sure that she herself was well hidden.

'I've got Zend's spear, at any rate,' she told herself grimly, her hand closing round the shaft. Churruk would expect her to be armed only with her own inferior weapon. That would do for Brild; Zip-Zip could deal with him. But Zend's spear should reach Churruk before he reached Zend's son. Then she looked down for a moment as the baby mammoth struggled to its feet, aware that something was approaching. Snorting, it backed into the forest again. Churruk and Brild in turn must have heard it, for Lulu saw them pause to listen ere on they came. Now she could hear their voices raised a little. Next, just a word or two-a broken sentence.

'I saw them . . .' That was Brild. 'They



"It's a baby mammoth,' Lulu guessed."

thought I was asleep. They took the river track.'

'Brild has been spying on us,' said Lulu to herself, amazed. But why? How had he guessed that spying would be profitable? Instinctively her thoughts went back to that night when she had run. Could it be Brild who had been beneath the hut? But surely he would not have had sufficient courage? In her excitement she parted the leaves in front of her to see the better. But Churruk's voice came booming down the stream, and she concealed herself again hastily.

'You should have followed them to the river bank,' Churruk shouted. 'I told you to

make sure.'

So Brild had acted under Churruk's orders. Lulu felt better. He had been less daring than she had thought. But what had made Churruk suspicious? She would probably never know. She watched him, frowning, examine the trails that entered the water. He had reached the swimming pool now; then he straightened himself, and his hand reached out towards Brild, enormous, threatening. Lulu chuckled to herself; this was worth watching.

'You fool!' Churruk snarled. 'Of course they have taken to the water, and we have lost them. Did you think that girl was as stupid as yourself? She's clever enough, the

little fiend.

'I am,' Lulu told herself, complacently. This was even better than she had expected. It seemed almost likely that Churruk did not intend to search further. He was shaking Brild now, while the latter howled dismally.

'How long do you suppose I have to waste?' Churruk raged. 'With all the tribe agog for a new leader? With half-a-dozen longing to take my place? You fool! I'll teach you

not to play with me.'

Brild did not answer; he could not, in fact, even howl any longer. His breath had given out; he was choking, black in the face, as Churruk gripped him by the throat and swung him off the ground. A second thus he hung suspended; then he was flung down upon the river stones. He lay quite still in a huddled heap, while Churruk eyed the river moodily. As he stood hesitating, a tree crashed in the forest, and almost instantly another followed, and round went Churruk's head, alert, intent.

(Continued on page 82.)

THE GREAT ARTIST.

A FIELD of flaming poppy-red,
A winding silver stream,
The great blue dome flung overhead
Where foamy white clouds gleam . . .

Vermilion in the bramble spray
That Autumn deftly turns;
A sober brown, a solemn grey
That lurks beneath the ferns...

A stretch of purple moor beyond
A meadow starred with gold,
A dragon-fly above the pond
With wings that rainbows hold . . .

An English hedgerow—velvet green;
Beneath, a splash of blue
Where nodding harebells hide between
The shadow and the dew . . .

The earth's a picture—colours bright
Extend from rim to rim.
God paints in secret through the night;
No artist is like Him!
H. L. G.



Solution to "What on earth is this?" (p. 49.)
The pieces, put together properly, make up the figure of an old-fashioned English Farmer or Country Gentleman of about 1867.

AUDREY'S SECRET.

A UDREY SCOTT finished her tea rather hastily, and was making a dash for the door, when her mother called: 'Audrey, where are you going?'

'Why, Phyllis Turner has promised to

teach me to ride a bicycle, Mother!'

'But you haven't had your practice yet.'

'Oh! that will do after.'

'I'm afraid it won't; you know very well you always practise immediately after tea.'

Audrey's face flushed with anger.

'It's a shame,' she said; 'fancy having to stay in, a lovely day like this. I wish I lived with the Turner's, their mother doesn't make them practise.'

And slamming the door behind her, Audrey

moved slowly towards the front door.

In a few minutes her mother heard her

banging away at scales and exercises.

That night, about eleven o'clock, Audrey awoke with a start. She could hear voices, and as she became more awake, she realised that it was her mother and father talking together in their room. Then she remembered where she was; her bed had been moved into the little room next to her parents, while her own room was being freshly papered. That was why the voices sounded so near, and Audrey could hear almost every word that was said. It was her father who was saying in a sad, tired voice:

'I'm afraid we shall have to try and cut down our expenses a bit. You know things have not been going on at all well at the Garage for some time. I often wonder if we did wisely in sending Audrey to the High

School; we cannot really afford it.'

Audrey turned over and tried to go to sleep; she knew she ought not to be listening. But it was not easy to settle down, for her father was speaking again, she could not help hearing.

'Apart from school fees there is the expense of music lessons. How would it be to let her drop music for a bit; she does not seem to

take much trouble with it.'

Audrey listened breathlessly as her mother

answered.

'No, I should not like her to give up her music. She would regret it one day. But I have an idea, I can help you a little anyhow. I have a few pounds that I have been saving up towards a holiday; you can have it towards Audrey's expenses this term, and perhaps later on things will get brighter.'

It was some time before Audrey could get to sleep again. She was wondering how she could help her parents. She thought it would be best to tell them what she had overheard, and also that she would not mind going to a cheaper school, and with this resolve she fell asleep.

But in the morning she was late in getting up, and only had a few minutes to eat her breakfast. Then something happened at school

which made her change her mind.

It was just after play-time when the Headmistress came into the class-room of the Third Form. She had a letter to read to the class. It was from a retired doctor who lived in the town. He was keenly interested in music, and had arranged for an examination in pianoforte playing, for which he was offering two prizes—ten pounds for a first and five pounds for a second. The examination was open for any girl in the High School under the age of fourteen.

It did not take Audrey long to make up her mind. Why, it was just the very thing, if only she could win ten pounds, or even five. But, she thought, I'll try and keep it a secret

from Mother.

On the way home from school the girls were talking excitedly of the coming examination, and guessing who would be likely to win the prizes. Audrey was quieter than usual, she was wondering what the music would be like; they had not yet seen the syllabus, but in any case, the Doctor had given them three months in which to prepare.

The next day Audrey called to see her music teacher, and together they agreed to keep the

examination a secret from Mrs. Scott.

Audrey started to work straight away. She did not try to escape her practice now; and whenever her mother went out in the evening, Audrey would rush to the piano to get in some extra playing.

But it was hard work, especially as the weather grew warmer. The examination was fixed for July, and often through the hot days of June, Audrey was tempted to neglect the

work.

Then the dreaded day arrived. The examination was to be held in the music-room of the High School, and a group of nervous girls were chattering together outside, awaiting their turn. To many of them the prize did not mean very much, but Audrey was out to win a holiday for her mother and father. Her

turn did not come until nearly last, and she did just about as well as she expected. The result would be announced to the school the next day, and the prizes given when the school broke up for the summer holidays. Audrey found it difficult, when she got home from school at dinner-time, not to talk about the examination.

After lessons the next day the whole school was summoned together to hear the result. There was much excitement as the Headmistress came in.

'I will read you the names and marks obtained of the two winners,' she said. 'Stella Ives, 96—Audrey Scott, 90.'

Audrey could hardly wait for the congratulations of her friends, she was so eager to tell her mother and father. She ran all the way home, and rushing into the house breathlessly, told the good news.

She laughed merrily as she saw how sur-

prised her parents were.

'You little schemer!' her mother said as she kissed her; 'but how you must have worked!'

'Yes, I can't think how she managed it,'

Mr. Scott said.

'But—come here, Audrey—aren't we just proud of you!'

MARY DIXON.

LIBRARY

WATER POWER.

By P. M. BAKER, B.Sc., M.B.E., A.M.I.E.E., A.M.I.Mech.E.

Illustrated by BERNARD WAY.

(Continued from page 38.)

The water supply for a pelton wheel.—In order to take advantage of water power at such great heads as those previously referred to, it is necessary that the power-house shall be situated close up to mountains or hills, so that the distance from the collecting ground, where the water is obtained, to the outflow is comparatively short, and for this reason we cannot plant our power-house just where we like. We must place it in the most convenient position for the supply of water and for getting rid of the water which has been used. Long pipe lines are not only expensive to construct, but they waste some of the head by the friction between them and the flowing water.

The water is obtained by building a dam across a valley high up the hills—where there is a mountain stream which carries a large quantity of water in rainy weather. Before the dam is built the site on which it (see page 80) has to stand is carefully chosen, and the surface layers of earth and soft material are excavated until solid rock is reached. This rock must be of a kind which is impervious to water, as if it were not the lake would be leaky, the water soaking out through the porous rock or through cracks and getting away. It is often necessary to put almost as much work and material into the foundations as into the

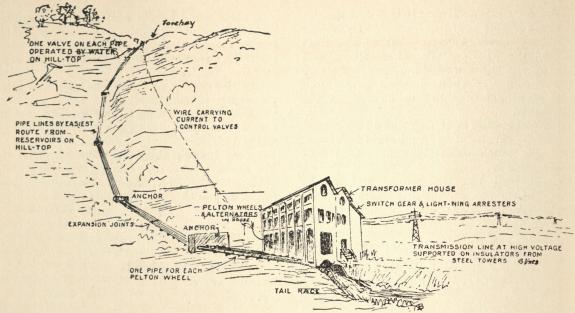
dam itself.

The thickness of the dam depends on its height, i.e., on the depth of water which it has to hold up, but it is always greatest at the

bottom and tapers off, as shown on p. 80, towards the top. The idea which is in the mind of the dam builder is that the water must not be able, by its pressure against the inside face of the dam, to overturn it or push it bodily off its foundation, while, when the lake is empty, there must be no chance of the absence of water pressure causing the dam or its foundations to be strained by its own weight. Dams are usually built of huge stones, with the gaps between them filled with smaller stones and concrete, so that the whole forms a solid mass consisting of concrete (a mixture of cement, sand and broken stone), with rough pices of solid rock, 'plums', as the navvy calls them, embedded in it. The faces of the dam are usually finished off with 'dressed' stones, not only for appearances, but because the water rushes over the 'down-stream' face when the lake overflows, and a suitable surface is therefore required. In France there have been several very large and very light concrete dams built in recent years, and these have shown marvellous advances on the type of dam mostly used in large works elsewhere.

A large power scheme often draws water from two or three valleys with a dam in each. The outflow channels are controlled by sluice gates in water passages through the foot of the dam, and they usually unite in a small reservoir, known as a fore-bay, which feeds the pipes supplying the Pelton wheels.

As the water will have to travel at a very

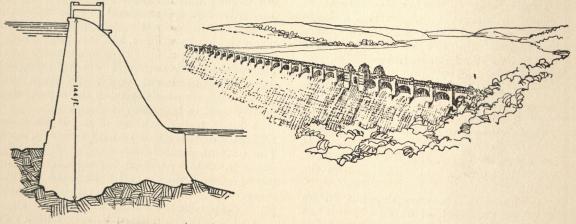


General arrangement of a "High Head" generating plant.

great speed through the nozzles—about four times the speed of an express train when the head is 1600 feet—it is very important that it shall be free from grit. Sand or fine grit carried by the water rapidly cuts away the inside of the nozzle, the spear valve, and the steel cups of the wheel. How are we to be sure that the water is clean? The water channels are generally lined with concrete, so that very little grit gets into the water when once it has left the big reservoirs, but flood water in a stream always carries some of the material of the hill-side and the water

channels through which it has rushed, and this must be got rid of in the fore-bay. The water entering the fore-bay is made to pass over a number of pockets, each intended to give sand and stones a chance of being caught, while the main outlet pipe or pipes to the power-house take their water from a point well above the bottom, so that only the clean upper waters of this small lake go into the machines; the grit and earth which settle in the comparatively still water at the bottom being periodically run off by another pipe to waste.

(Concluded on page 92.)



A section and a general view of a big dam.



"She discovered he had collapsed completely."

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. FARMER.

(Continued from page 77.)

CHAPTER X.
THE BABY'S MOTHER.

'IT'S the she-mammoth. The baby mammoth couldn't make all that noise,' Lulu reasoned to herself, a little breathless, as she, too, listened. 'Of course its mother must be

near; I ought to have remembered.'

Already Zan and Zip-Zip were edging along the branch towards her, and she signed to them to make haste, as a third tree fell. Judging from the sound, the mammoth was heading for the river. If it should take a fancy to their oak, it was at least an easy drop from the branch end into the water. Churruk would see them, possibly; but that no longer mattered greatly. He could not harm them, for he would have to save himself by flight. This new and imminent danger had made him almost an ally.

The mammoth was creating a terrific commotion, trampling on everything that barred its path. And mingled with the constant crashes was now a terrifying, moaning bellow. At the echo Brild stirred a little, but Churruk paid no attention to him. He had wheeled, and was poised for flight towards the settlement. The mammoth seemed likely to emerge between the oak-tree and the track-end. But it might yet change its mind, and bar the homeward way, and Churruk evidently was but waiting to make certain. Slowly Brild raised himself upon his elbows, blinking. Stunned at first, his senses, one by one, were re-awakening, conveying a warning of the approaching peril. He broke into a little whimpering cry, and tried to drag himself towards Churruk.

'Help me!' he whimpered; 'something is coming. I can hear it. My leg is hurt; I

cannot run. Oh, Churruk, help me!'

Churruk did not answer, nor did he turn. But satisfied at last, it seemed, he darted up the trail. The mammoth was still invisible; but the branches overhead, about fifty yards away, were shaking. From her perch Lulu could see them. Zip-Zip and Zan were looking at them also.

'It is coming; he will be killed,' cooed Zip-Zip, glancing next at Brild. He was now trying to reach a large boulder beneath which

he might squeeze himself, one leg dragging behind him, his eyes starting from his head in terror. Zip-Zip watched with interest. Not only did Brild owe her a heavy debt; he had always done what he could to make her life unbearable. But in addition he had tried to harm Lulu, and so no death could be too bad for him, Zip-Zip felt. And the mammoth might be satisfied with one victim. If it caught Brild, there was a better chance it would not concern itself with the three in the tree. The wind blew from them to the fishing pool; it would not scent them.

Brild will be killed,' Zan echoed, parrot-wise; then, perplexed, it seemed, he looked at Lulu. It had been Zend's habit to talk much to his son; to impress on him from the time he could understand at all the rules by which Zend governed himself and the tribe. He had told him that man must not league himself with the wild things against man. Lulu had been present on that very occasion—she was apt to haunt Zend's neighbourhood—and since Zan was unaware of Brild's crime, he was beginning to wonder why she sat so still.

'Shall we help him to get to that rock?' Zan asked, and pummelled Lulu with his small, hard fist. 'Quick! Shall we jump and swim

to Brild?'

Lulu pushed the fist away; but she, too, had remembered Zend's teaching, and the memory was persistent, though she was trying to banish it. Zend had said more than Zan could recollect; she, older, recalled it.

'Man must always help man—even his enemy—against the wild things when it comes to a fight between them,' Zend had said; 'or otherwise the wild will conquer altogether, and in a little while there will be no more men.'

'But man fights man,' Lulu had urged.

'Man fights man that the strongest man may win, but not the strongest beast,' Zend had answered. And Lulu, remembering, looked

at Brild gloomily.

Must she apply Zend's teachings now? If Brild were in danger, he had himself to thank. She agreed with Zip-Zip that the world would be well rid of him, though he was kin to her; the beast their mutual enemy. He had betrayed her, spied on her. And at that Lulu

IBRARY

frowned at a thought that would obtrude itself. He had spied on her, and she had run away. But . . . here was her chance! She could show Brild now she was no coward; that she was, in fact, far braver than was he. She could prove to him how little cause he had to boast. She would prove it. She acted quickly, with

all her customary lack of hesitation.

'Hold on to Zan,' she flung at Zip-Zip; 'I'm going.' She dived, and then was battling with the current. Luckily, she had often swum the stretch that lay between her and Brild, for, though not long, it was tricky. To avoid the worst of it, a swimmer must tack from bank to bank. Behind her she could hear Zip-Zip yelling, regardless of resulting danger to herself and Zan. Zan joined in lustily, but from Brild in front there came no sound. Lulu was too low in the water to see what he was doing. It was not until she splashed out into the shallows that she discovered he had collapsed completely.

NEWS.

BETWEEN the years 1695 and 1730, it was the practice to put over the newspapers the initial letters of the compass, thus :-

N W + E

This sign meant that the papers contained intelligence from the four quarters of the globe. From this practice the word 'newspaper' is sometimes said to have been derived; but it probably comes from the usual meaning of the word 'new.

SNAILS AND FAIRIES.

SIGNS of the fairies everywhere! On the garden path there's a silvery trail, Perhaps you'll suggest it's the track of a snail, But we know better-it's just a slide Prepared by the fairies for Christmas-tide. That the track of a snail? Oh, no! Snails have gone to bed long ago.

Snails don't relish the cold, I'm told, So into their houses deep they creep, In the cosiest corner to lie asleep, With their front doors locked, till the warm days

If visitors call, they will be 'not at home.' Isn't it shocking? I think they might Wake in the day-time and sleep at night, Like a child, you know, or a bird or a daisy-They can't be tired, so they must be lazy. LILIAN HOLMES.

He was no longer trying to reach the boulder. Paralysed with fright, he goggled at her, his lips so dry he could not even speak. The mammoth had ceased to bellow, but Lulu could hear it breathing in gusty pants, though it was still out of sight. She clutched at Brild's shoulder, and shook him vigorously. He must make an effort; he was too heavy to carry. At the worst she could leave him. But the mammoth's insolence was beginning to annoy her; it should not beat her. She would win. When Brild made no response, she tried again.

'Do you want to be left here?' she asked him. Then she heaved him up, pulled his arm round her neck across her shoulders, and, holding his wrist with one hand, pressed the other against his ribs. A moment he hung limply; then, to her relief, he scrabbled along

beside her.

'Woof!' said the mammoth; 'wo-of!' (Continued on page 90.)

MY DIARY.

Written and illustrated by RUTH COBB.

IV .- NOVELISTS' DIARIES: FANNY BURNEY AND HENRY FIELDING.

RANCES BURNEY, a girl of fifteen, known to her family as Fanny, and a famous novelist, kept a diary from a very early age. These first volumes she destroyed. 'I burnt all up to my fifteenth year-thinking I grew too old for scribbling nonsense.' On March 27th, 1768, she began again with an amusing Introduction, 'addressed to a certain Miss Nobody.' She evidently found it a help in writing to have some definite reader in her mind, an admission which makes her diary unique. She opens the dedication with, 'To have some account of my thoughts, manners, acquaintance, and actions when the hour arrives, in which time is more nimble than memory, is the reason which induces me to keep a journal. A journal in which I must confess my every thought, must open my whole heart! But a thing of this kind must be addressed to somebody. I must imagine myself talking-talking to the most intimate friends-to one whom I should take delight in confiding and remorse in concealment; but who must this friend be?'

She evidently enjoyed the writing very much. She soon says, 'I cannot express the pleasure I have in writing my thoughts at the very moment my opinion of people when I first see them and how I alter and how confirm myself in it.'



Fanny Burney's House in St. Martins's Street.

The Diary writing was not looked upon with entire approval by Fanny's family. Her father, Doctor Burney, an authority on music, found a page of it, and although he did not actually forbid her to continue, said that if he found any of it lying about again, he would post it up in the market-place.

Presently Fanny forsook 'Miss Nobody,' and definitely addressed part of her journal to her sister or a friend of the family known to them as 'Daddy Crisp,' or occasionally to her father, though she never wavered from the idea of keeping it absolutely private to herself.

The Burneys lived in London, at 1 St. Martin's Street. They knew most of the famous artistic and literary people of the day, among them Sir Joshua Reynolds, the painter, David Garrick, the actor, Dr. Johnson and Boswell, and many others, of whom she gives vivid

word portraits. Fanny Burney had an extraordinary power of memorising, and writing down actual conversations, not just shortly, but over many pages. It was in this style she wrote her novels-in the form of a diary and with long conversations. They seem to have evolved quite naturally from her own diary. The first novel, Evelina, which immediately made her famous, was published in 1778. The fact that she was writing at a novel, she kept secret from everybody. In the diary she says: 'The fear of discovery or of suspicion in the house made the copying extremely laborious to me, for in the daytime I could only take odd moments, so that I was obliged to sit up the greatest part of many nights in order to get it ready.'

She confessed to its authorship before the actual publication of the book. Although it was published anonymously, the secret was soon known to all the world. She begun the year

1778 with the entry:

'This year was ushered in by a grand and most important event! At the latter end of

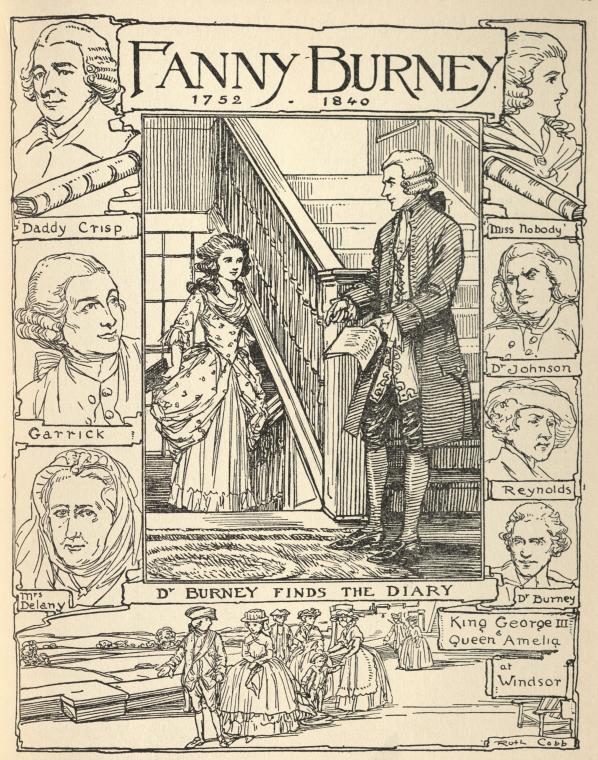


Henry Fielding.

January, the literary world was favoured with the first publication of the ingenious and learned and most profound Fanny Burney.'

Fanny found herself suddenly famous, and





she made many new friends. It was now that she saw a great deal of Samuel Johnson. It was through an old friend, Mrs. Delany, that she became personally acquainted with George III. and Queen Amelia, and was offered by them the post of 'Dresser to the Queen' or 'Keeper of the Robes.' She accepted, although she felt 'the life of attendance and dependence' unsuited to her tastes. She held the appointment for five years. She loved the King and Queen and the young princesses, but she detested the senior Keeper of the Robes, a Mrs. Schwellenberg, with whom a good deal of her time had to be spent. She writes the story of these days, and the household she was among, most amusingly in her diaries, though she was subjected to a great many menial duties, which must have been very galling to her. She tells how she rose at six, to be ready when the first summons came for her to attend the Queen, and at intervals all through the day she was rung for, the last summons being between eleven and twelve o'clock at night. Even her leisure moments were unhappy, for she says, 'Poor Mrs. Schwellenberg so wore, wasted and tortured all my little leisure, that my time of repose was in fact my time of greatest labour.' At the end of five years she could bear the life no longer, and she and her father drew up a memorial, asking for her to be released from her duties.

Two years after she left the Court, Fanny Burney married Count D'Arblay, a French refugee. From that time she only kept her diary intermittently. In her old age she carefully arranged and annotated her diaries, for she must then have realised that what had originally been written for herself alone would, now that she was well known as a novelist, be of interest to many others as a record of other

famous people besides herself.

Another famous novelist who kept a diary, although only for a short while, was Henry Fielding. Besides being a writer, he held an appointment as a magistrate. His health became ruined, so as his friends advised him to see what a warmer climate would do for him, he decided to go to Lisbon, a much greater undertaking at the time he lived, the eighteenth century, than it is now. The only vessels were sailing ships, and they were entirely at the mercy of the wind. During this voyage Fielding kept a diary, and there is no doubt that he intended that it should be published, and hoped that his family should be benefited by its sale.

The Diary opens on 25th June, 1754, with an account of the setting out His wife and eldest daughter were to go with him. As Fielding had lost the complete use of his legs, the getting him on board the boat was a difficult matter. He was carried by some strong men into a little boat, and then, when the ship was reached, hoisted in a chair on to

the deck by pulleys.

Once on board there was delay in starting. On the 27th the wind blew a hurricane. It was necessary, from time to time, for Fielding. owing to his suffering from dropsy, to have a slight operation performed, and he felt if there was so much delay it might be extremely awkward for him. The captain assured him that 'he had a pretty young fellow on board, who acted as his surgeon, as I found he likewise did as steward, cook, butler, sailor . . . and went through them all with great dexterity: this surgeon was, perhaps, the only one in which his skill was somewhat deficient.' As the ship was still stationary Fielding sent for his friend, Mr. Hunter, the great surgeon from London, and the sea surgeon attended the operation as a student. After that Fielding felt no further apprehension in case he was ill on the vovage.

On Sunday, June 30th, 'the ship is on the point of starting as far as Gravesend.' Fielding enters in the diary, 'My poor wife, after passing a night in the utmost torments of toothache, resolved to have it drawn. I despatched, therefore, a servant into Wapping, to bring in haste the best tooth-drawer he could find. He soon found out a female of great eminence in the art, but when he brought her to the boat, at the waterside, they were informed the ship had gone. The tooth-drawer refused to follow the ship, and Mrs. Fielding had to endure the

ache.'

Later in the day there was a small adventure. 'Whilst we were at dinner this day in the cabin, on a sudden the window on one side was beat into the room, as if a twenty-pounder had been discharged amongst us. The sash, which was shivered all to pieces, was pursued into the middle of the cabin by the bowsprit of a little ship called a codsmark.' Life was not always so exciting. For two days they were becalmed off Deal.

On July 13th they were off the Isle of Wight, there, as 'the wind seeming likely to continue in the same corner, where it had been almost constantly for two months together, I

was persuaded by my wife to go ashore and

stay at Ryde till we sailed."

So contrary was the wind that they did not finally get away again until the 23rd July; then they encountered rough seas, and all the party, except Fielding himself, were stricken by sea-sickness. On Sunday, July 26th, they recovered. 'Things now began to put on an aspect very different from what they had lately worn: the news that the ship had almost lost its mizen and that we had procured clotted cream and fresh bread and butter, restored health and spirits to our women and we all sat down to a cheerful breakfast.'

At Torbay there was another wait for the wind, and it was not until the 22nd August, nearly two months after she had left London, that she finally set sail. After many variations of weather, they reached their destination a fortnight later. The delays at the customs much annoyed Fielding, but at last the party was allowed to land at what, in his highly incensed mood, he describes as 'the

nastiest city in the world.'

The voyage, unfortunately, brought Fielding little relief, and he died shortly afterwards. In this diary of one of the greatest of English novelists, we realise what he went through in his efforts to regain his health, all without avail.

HARD WORK.

PHIL and Bee and Sugary Sam
Decided they'd agree—
'It's stupid to squabble,' said Sugary Sam,
'Silly to quarrel,' said Bee;
Said Phil, 'We will be good until,
At any rate, after tea.

'But if you crib my favourite chair
When I have bagged it first,
And if Sam sneaks the jammiest bread
And leaves me all the worst,
And if 1 still have to be good,'
Said Philip, 'I shall burst.'

LILIAN HOLMES.

THE ORIGIN OF MUSIC.

AN IRISH FOLK-TALE.

Long and long ago there was no music in Ireland at all, at all, unless what the birds made when they sang, or the children, as they laughed at their play; but as to flute or fiddle, bugle or bagpipes, such a thing was never

heard or dreamt of, so there was no dancing either, for how could the boys and girls dance

without music!

Well, in those old ancient times, the legend says, there lived a giant and giantess in the country-they were common enough in those days-and Cool and Canola were a fine, hearty, handsome couple, and a great size entirely. They thought nothing of eating a whole cow for dinner, and a sheep for breakfast, with a dozen or so of boiled eggs thrown in! They had good flocks of cattle and sheep and pigs, and dozens of fowls and geese too-full and plenty of everything, in fact, you might say—but, in spite of that, they were always quarrelling and fighting, for Cool was a hasty, hot-tempered man, while Canola was impatient and wilful, and had a very sharp tongue, so it is no wonder that they often fell out.

Years passed by, and almost every day when Cool returned from looking after his flocks and herds, there was some falling out, and matters reached a climax when the giant came back one evening, weary, hungry, and thirsty, having been wandering since dawn in search of some of his beasts that had strayed away into the thick woods round his home. When he reached the rude stone dwelling, he found that there was no fire lighted, and no preparation made for the evening meal, and Canola, in a very bad humour, was sitting idly by the door. As she only laughed in reply to his complaints, he took a stick to strike her, but she ran away, hotly pursued by her angry

husband.

Now, no woman in the four walls of Erin could run so fast or so lightly as Canola, so her husband very soon lost sight of her. She ran on and on till she reached the shores of Lough Neagh, and saw the great lake stretching far away to the dim gray hills of Tyrone, and she thought she would like to take refuge among their heights, where Cool would find it hard to trace her. There was not a human being to be seen, but as there were cattle in the fields, she decided that it would be wiser to go farther still lest some shepherd, or pig-keeper, should spy her, and tell Cool, if he chanced to come that way. So she ran on faster than ever, climbed the steep hills, and at last reached the open sea on the wild North Coast of Ireland; and there for the first time she paused, for she heard a strange, but very sweet sound, such as she had never heard before. Sometimes it rose

like a sad but melodious cry, shrilling louder and louder above the sound of the waves, then it sank to a low soft murmur, more delightful still. Canola approached the place from whence the mysterious sounds came, and listened in fascinated wonder. The wind rose higher, and the strange tones rose with it, clearer and sweeter than ever, and the giantess, going down on the shore, saw the skeleton of a huge fish, and the sea-breeze playing through its bones was what caused the wonderful sounds. listened spell-bound to the first music she had ever heard, forgetting her angry husband, who presently overtook her, and hearing the music, paused too, and waited near Canola, who did not see him, so entranced was she. He was just as charmed with the strange sounds, and he quite understood why his wife stood motionless by the great skeleton. All wish to punish her left his mind, and he resolved to have music for himself. He went into a little grove near the shore, which was full of slender trees and bushes-hazels, willows, and ashes. Cutting

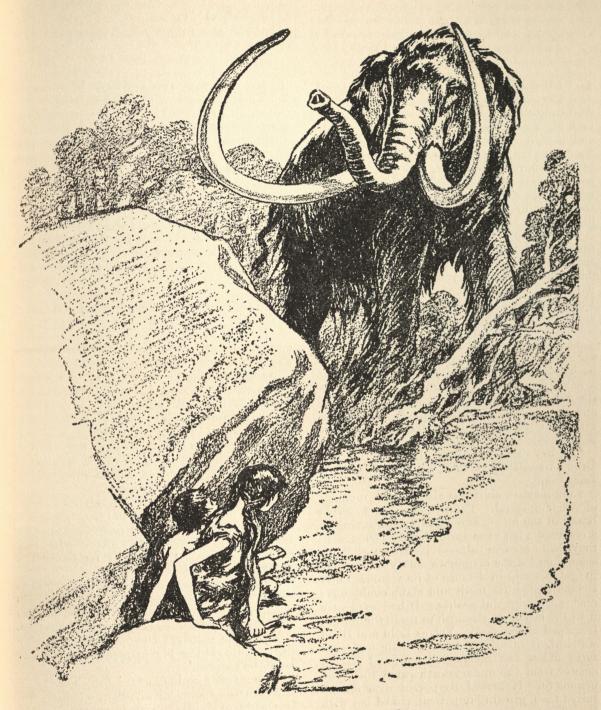
down a slim sapling, he scooped the wood into a sort of bow, and strung lengths of deer-gut within it, and drawing his fingers across them, he found to his delight that he could make even sweeter sounds than those produced by the wind, as it blew through the fish-bones! Hearing it, Canola turned, and went towards the spot whence the new sounds came.

When she entered the little grove, she caught sight of her husband, playing upon the crude musical instrument he had made. Instead of running away in a fright, she went up smilingly to him, and the giant, his anger vanished, welcomed her eagerly, and showed her how he had made this primitive harp, or lyre. They went home hand in hand, music had banished their anger, and was a ceaseless source of pleasure to them. Ever afterwards they led a happy, contented life, and their neighbours, learning the cause, eagerly hastened to make similar instruments for themselves. And that is how music first came into Ireland!

MAUD E. SARGENT.



THE KING'S HIGHWAY IN "THE GOOD OLD TIMES,"



"A huge black mass hove into sight."

THE DIM RED DAWN.

By Mrs. HOBART HAMPDEN, Author of 'Louisa,' 'The Hidden City,' 'Princess Ooma,' &c.

Illustrated by E. S. Farmer.

(Continued from page 83.)

LULU dared not look to see how close it was. The sheltering rock was at least near. And beneath it, she could now see, was room for both of them. The rock was of softish stone, and usually stood clear of the river; but at flood-time the water undercut it so that it was heavier above than below, and the last flood had scooped out its pebble-bed. As Lulu reached the edge of the hollow she let Brild slip, and rolled him over into safety; then she backed after him.

She was only just in time. As she faced the shore, a huge black mass that seemed to shut out the entire sky hove into sight. A moment it loomed thus; then, sideways, down it crashed, half in the water, half out of it. Up rose a cloud of spray that drenched Lulu and left her gasping. She could not see what was happening until it had dispersed.

The mammoth still lay where it had fallen, she was next aware, its great side heaving, its back towards her; and in that back there was a deep, deep wound extending down towards the heart, and other wounds about its head and neck. One ear was damaged, and as it raised its trunk and let it fall, Lulu noticed blood dripped into the water.

'It has been fighting,' Brild whispered. Drawn irresistibly to look, he had crawled to Lulu's side.

Lulu nodded, oblivious also for the moment of their quarrel. There were other great beasts in the forest, she knew, as powerful as a mammoth, but even rarer, and seen so seldom they had become almost legendary. With some such foe the mammoth surely must have fought, perhaps in defence of its young. Only the most gigantic teeth and claws could have made such frightful gashes. It had evidently used the last of its strength to reach the water: it seemed almost dead. Yet, as Lulu and Brild watched, it raised its head a little and sent forth a low and melancholy cry, and out in answer from the undergrowth came the baby mammoth. It looked its parent over doubtfully; then, growing impatient, poked her with its tusks.

'We can kill it directly the big one dies, and take those tusks,' Brild whispered eagerly.

Tusks, he knew, could always be exchanged for food. Of any size or shape, they were a valued trophy. Then, as Lulu, remembering, glowered at him, he slunk away from her a little. She paid no further attention to him; she was too absorbed in watching the scene before her.

The mother mammoth was quieter now. Her vast side still heaved, but more slowly. All at once out shot her legs—up rose her trunk again and fell; and as the baby squealed affrightedly she heaved a ponderous sigh, and lay almost motionless.

CHAPTER XI.

BOBO FOLLOWS.

'Is she dead?' Brild whispered again.
'Why are you watching her like that?'

'I'm watching her tail,' Lulu told him, curtly. 'Till a wild thing's tail is quite, quite still you can never be sure it's really dead.'

As she spoke, the mammoth's tail, the tip of which was quivering, dropped limp and lifeless. The baby ran and tugged at it, as it perhaps had often done in play; then it howled mournfully, and instantly out came Lulu's head from her hiding-place. Here was a pet worth having, and, for once, there was no tiresome parent to interfere. She stretched a hand out coaxingly. 'Come, come to me,' she called.

'No, no,' Brild whined. 'Don't call it, Lulu; it might hurt us. It's quite near enough to kill now. If you haven't room to throw your spear, I've got a dart I brought with me. I'll hit it in the eye. I'll blind it for you. Wait a minute.'

If there was not room enough in which to swing a spear, it was possible to smack Brild's head. Lulu smote it, hard. Then, leaving him weeping behind her, she edged out into the open.

From the oak-tree came a shriek from Zip-Zip: 'Lulu, is the big mammoth quite dead? Lulu, be careful.'

'I'm coming to look at it,' Zan shouted.

There was a splash; another followed. The two were evidently on their way to join her. The baby mammoth, scared by the noise, was backing. It might bolt at the sight of Zip-Zip and Zan, Lulu realised, annoyed.

このなるなが

'Tiresome child!' she frowned. 'I'll teach Zan to interfere with me.' Then she bent her whole attention to the task in hand. She broke a small branch from the nearest tree, reached out with it and stroked the baby's neck. Perhaps its mother had stroked it with her trunk. If she could only make a mammoth noise it might please it; but that, she had to own, was beyond her.

And it mightn't be the right noise, anyway,' she reminded herself. 'I don't know what their

bellows mean.'

Her treatment, so far, was proving successful. The baby seemed to like the tickling branch. It stood quite still; only its large ears flapped, its tail twitched slightly. Inch by inch Lulu crept close to it until she could touch it with her hand. It overtopped her already by a couple of feet. It squinted at her sideways as she offered it her branch. Then a cavern opened where its mouth was, and down went her offering.

'At any rate we shan't have to feed it with

our salmon,' Lulu reflected.

Having tamed it thus far, she was already hopeful it would follow to the caves. And, so reminded that those caves were still distant, she turned from the baby to Zip-Zip and Zan who had now reached the large mammoth, which they were inspecting. And Brild had crawled into the open and was staring at it also. His fate must be decided first. He squirmed unhappily as Lulu looked at him.

His leg was certainly injured. She had

thought most likely he was more frightened than hurt, but the limb was swollen from knee to ankle already. He could only crawl, and must take hours to reach the huts. The tribe would shun the river track, as Churruk would spread the news of the mammoth's arrival. If he mentioned Brild, it would be to assume that he was dead. No one would look for Brild. There was no need to trouble further about him. He was no longer a menace; he was helpless.

'It's time we were going,' she told Zip-Zip.
'We've wasted half the day.' And, at that—
'You are going?' Brild echoed, blankly.

'You are going?' Brild echoed, blankly. 'But what shall I do?' he questioned, horrified, as he realised he would soon be alone.

'Whatever you like,' Lulu told him. 'Stay here; go back to Dilda. We don't care.'

'But I shall never reach the fires before it is dark,' Brild gasped. 'I shall be killed; I

shall be eaten,' he reminded her.

'Very likely,' Lulu agreed, cheerfully. Brild's future was no concern of her's now. Not only had she vindicated herself, but she had done all that Zend's law required of her, she considered. Brild, for the moment, was in no actual danger. She could not be expected to deal with possibilities. Humming to herself, she looked casually over his head at the track leading to the clearing. Then she stared in amazement, for Bobo was coming down it. He was running towards the river, waving something clasped in his hand.

(Continued on page 103.)

ROOFS.

THERE are red roofs and brown roofs and yellow roofs and grey,

There are purple roofs and green roofs. O roofs are very gay.

They shine out on the country side, and even in the town

They put on a fairy beauty as the sun goes down.

The red roofs are made of tiles. Warm and rich they glow,

On new-built villa, ancient barn, and homes of long ago.

All the colour of the forest and the moorland, Autumn blown,

Is in the red roof's beauty as the sun goes down.

The grey and blue and purple roofs are only made of slate:

They cover houses-in-a-row and lodges at the gate,

Of public parks and burying-grounds. But over them is thrown

A softened, glowing beauty as the sun goes down.

The roofs of brown and yellow are of real country thatch,

On real country cottages each in its garden patch:

With green moss growing on them, or grass the wind has sown.

O these are full of beauty as the sun goes down.

There are red roofs and brown roofs and yellow roofs and grey.

There are purple roofs and green roofs. O roofs are very gay.

They shine out on the country side, and even in the town

They put on a fairy beauty as the sun goes down.

WATER POWER.

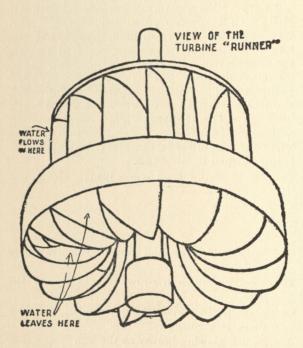
By P. M. BAKER, B.Sc., M.B.E., A.M.I.E.E., A.M.I.Mech.E.

Illustrated by BERNARD WAY.

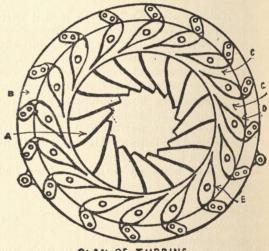
(Concluded from page 80.)

TURBINES FOR MODERATE AND LOW HEADS .-The Pelton wheel is only at its best when the head is considerable, as on low heads the very great quantity of water to be dealt with and the low velocity at which it emerges from the nozzles make the machine heavy and cumbersome for the power it generates. In these circumstances

between the vanes on the wheel in the direction of rotation, thus impinging on the vanes, which deflect it over their smooth surface inwards and finally vertically downwards to the rail race. Why does this cause the wheel to revolve? When water or any other material is in motion, it tends to travel in a straight



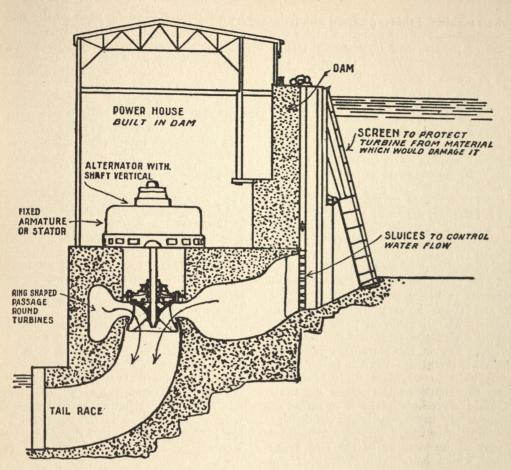
another kind of turbine is employed. In the type which is most favoured at the present day, the shaft is vertical and carries a 'runner,' i.e., a series of vanes fixed to flanges on the shaft. The water enters a casing round this wheel and passes through a number of guide blades, which cause it to enter the spaces



PLAN OF TURBINE

- A. Moving blades driven by water.
- B. Fixed Frame.
- C. Flow of Water.
- D. Guide Vanes (stationary).
- E. The direction of the Guide Vanes is altered by the Governor, thus controlling the water admitted and the speed.

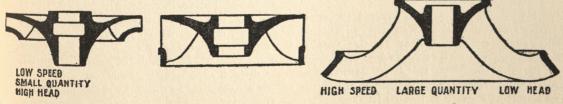
line, and deviation from a straight course can only be brought about by the application of force. The water which flows through the turbine wheel is deflected from the course set by the guide vanes by the vanes on the runner, on which it therefore exerts force, thus driving the vanes forward. You can see this elemen-



tary principle very well for yourself if you place the garden hose in a curve on the lawn and then turn on the water. The pressure of the water, passing round the curved course of the pipe, exerts a force on the pipe which will probably cause it to straighten itself out.

Variations of blade form and of the casing and inlet arrangements of turbines have caused many names to be given to them, but the general principle is the same in all as in the type which is here described, that known as

the Francis turbine. The largest turbines in the world—for example, a new one which works on water which would otherwise go over the falls at Niagara, and which is intended to generate 44,000 horse-power, are of this kind. The pipe arrangements for a Francis turbine differ from those for a Pelton wheel chiefly in size and strength. When the head is low the quantity of water to be passed per minute is tremendous, and very large pipes are in consequence necessary. Above is a diagram of a



THREE RUNNERS SHOWING HOW THEY ARE MADE TO SUIT VARIOUS HEADS OF WATER

vertical shaft turbine of this type, from which the general arrangement of the machine and some rough idea of its size can be obtained; it is built in the dam itself. One of the difficulties met with in these big machines is that of supporting the weight of the rotating mass. This is mainly done by a 'thrust bearing,' but the manner in which the water is deflected enables it to exert a force upwards on the runner which helps to carry this weight. The kind of thrust bearing most frequently used is particularly interesting-it is carried on a number of shoes which are pivoted near to one and on a collar attached to the shaft. When the shaft is rotating, the front end of each tilts up very slightly indeed, and a very thin, slightly wedge-shaped layer of oil (clinging to the surfaces) is drawn in between it and the fixed ring on which it is rotating. The shoes float easily on this layer of oil, its wedge-like form prevents it being squeezed out of the bearing, and there is very little friction in consequence. The diagram on page 96 shows a bearing in which the collar rotates and the pads or shoes are on the stationary part, but the principle is the same. Francis turbines are now being built to work on high heads by modifying the shape of the vanes on their runners, and the sections in the illustration on page 93 show how these results are obtained.

If you think over the elementary principles which apply to the working of the two types of turbines which have been described, you will probably see that they are wonderfully alike, much as they seem to differ on first examination. In each case the direction of flow of the water is altered, and this alteration is the source of the force exerted by the water on the wheel. The essential difference between them is that in the Pelton wheel all the energy is converted into the kinetic or velocity form in the water before it strikes the wheel, while in the Francis turbine the water is under pressure while passing through the vanes, and the same general idea will be found

to apply to the steam turbine also.

The Pipe Line.—There are several interesting things to be learnt from the pipe line which connects the fore-bay to the powerhouse. The pipe or pipes have to be sufficiently large for the water to travel at a moderate speed through them, as otherwise a considerable amount of energy is wasted in friction.

Engineers generally prefer that there shall

be a separate pipe for each of the turbines in the generating station, in order that, when it is necessary to do any repairs, the whole of one set, consisting of a pipe, a turbine, its alternator, transformers and switches, can be closed

right down and overhauled.

In one very good arrangement which is sometimes adopted there are two pipes out of the fore-bay for some portion of the distance. and these open into a connecting cross-pipe or 'manifold' from which the separate pipes for the machines issue. When this arrangement is used it is possible to have a valve on each of the pipes out of the cross header, and as these valves are usually large (the valve required for a 13,000 horse-power set on a head of 1600 feet would be about 3 feet 6 inches in diameter). hydraulic cylinders which take water under pressure from the two pipes on the 'uphill' side of the valves are used to open and close These valves and their cylinder are shown on page 96.

As the pipes go down the hill face the pressure gets greater and greater, and the thickness of the wall of the pipe has to be increased accordingly. The pipes themselves, when large, are very often made of plates which are riveted, rolled up into pipe form, and along a longitudinal seam, for use in places where the pressure is not very great, but, for the high-pressure end of the pipe lines, either welded or solid drawn pipes are generally

used.

Such pipe lines as these are usually placed above-ground, the pipes resting on masonry or concrete saddles, which permit them to expand and contract on hot and cold days. There are expansion joints at frequent intervals where one pipe fits into the next through a gland which prevents leakage of water but permits sliding of one pipe into the other, varying distances.

One point which will be quite clear to those who have read the earlier part of this article, is that the pipe line has to be straight. If you try the experiment with the garden hose which is suggested earlier you will realise that this is so, for, exactly as in that case, the pipe line, if it were curved, would endeavour to straighten itself out, and although you can control a garden hose, it would be nearly impossible to control a pipe which, even on a 'high head' plant, may be as much as seven or eight feet in diameter.

If, however, it is necessary for any reason

to change the direction of the pipe, this is not done by means of a curve, but instead the line consists of straight lengths of pipe which are connected at the points at which change in direction (always kept small) takes place, and at each such point a heavy anchor of masonry is situated to prevent the pipe moving. There are smaller anchors half-way between each two expansion joints. As we go further down the hill and the pressure increases, the walls of the pipes have to be made thicker, until, at the bottom, the pipes may be of steel an inch in thickness.

At the bottom of the hill the pipes have to enter the power-house, and at this point a valve has to be supplied to control the water supply to each of the turbines. This valve is usually provided with a by-pass, as it is most important that it should be opened and closed gently. If you have observed what happens when an ordinary domestic water-tap is quickly turned off, you may have noticed that there is a sort of shock produced by the sudden stoppage of the water flow. If the water, moving along the pipe, is suddenly stopped, its kinetic energy is as suddenly converted into the pressure form and, as a result, there is a very considerable momentary rise of pressure. This is called the 'water-hammer' effect, and although waterhammer effects can take place in ordinary small water pipes without much danger of bursting, it is quite a different matter when very highpressure water travelling at a considerable speed in a large pipe is suddenly stopped. The sudden closing of a valve on a water-power main would almost certainly cause bursting of

It is for this reason that a small pipe forming a by-pass is provided. When a machine has to be shut down the by-pass is left open and the main valve is gently closed. When this has been done the by-pass can be closed also, as the water will have come nearly to rest.

For the same reason the spear valve of a Pelton wheel is never permitted to operate suddenly. If the governor has to act quickly owing to some cause, such as the breaking of a coupling between the wheel and the alternator or to the load being switched off, there is a special device, such as the tilting of the jet downwards, which can operate instantaneously while the spear valve is moving inwards slowly.

For plants working on moderate heads, such as some of those for which Francis turbines are

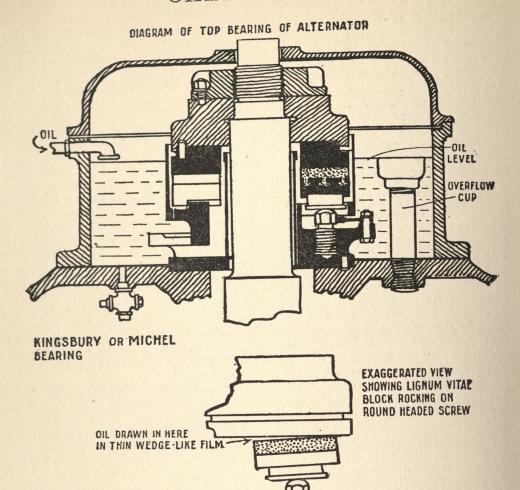
used, the valve arrangements are very often situated at the inlet end of each pipe. The pipes are made as short and as direct as possible, and the speed control is then carried out by means of adjustment to the guide vanes of the turbine.

How is the Power utilised?-Power-houses in which water power is utilised have to be, of necessity, near to the hills whence their water supply comes and therefore miles away from the towns where the factories which demand power are situated. The power could, of course. be utilised by building new works near to the power-house, and in some cases this has been done, but it is not necessarily a good arrangement. Works have to be situated where the goods they make can be easily disposed of and where their raw materials are readily accessible, and these conditions are unlikely to exist near the power-house. The turbine usually drives an alternator-generally a three-phase machine —and the power is conveyed electrically, usually at very high voltage, in some cases as much as 100,000 volts, to the town or towns where it is to be used.

If you give the matter some thought, as engineers have done for several years, you will probably realise the importance of utilising, to the full, this ready-made power which Nature provides, and reserving fuel for use where water power is either non-existent or difficult to obtain. England's resources in this direction are small compared with those of many countries, but little effort has been made to utilise what we have—probably because we had an abundant supply of cheap coal. The increase in the cost of coal which took place during the war has again turned our attention to our water resources, and budding engineers would do well to give all the attention they can to the subject, as there are likely to be great developments in this direction (unfortuna ly mostly abroad) in the future. In any case, it is our duty to utilise natural resources as far as we possibly can and to conserve the diminishing fuel supplies of the world.

Even while this book is being written great advances are being made, in America, in Switzerland, Italy and France, especially in the utilisation of water power, and the high price of English coal has had a quite important share in bringing this result about.

(The next article in this Series will deal with Hydraulics.)



TWO LARGE PIPES FROM RESERVOIR This end covinces to second pipe

DUSK.

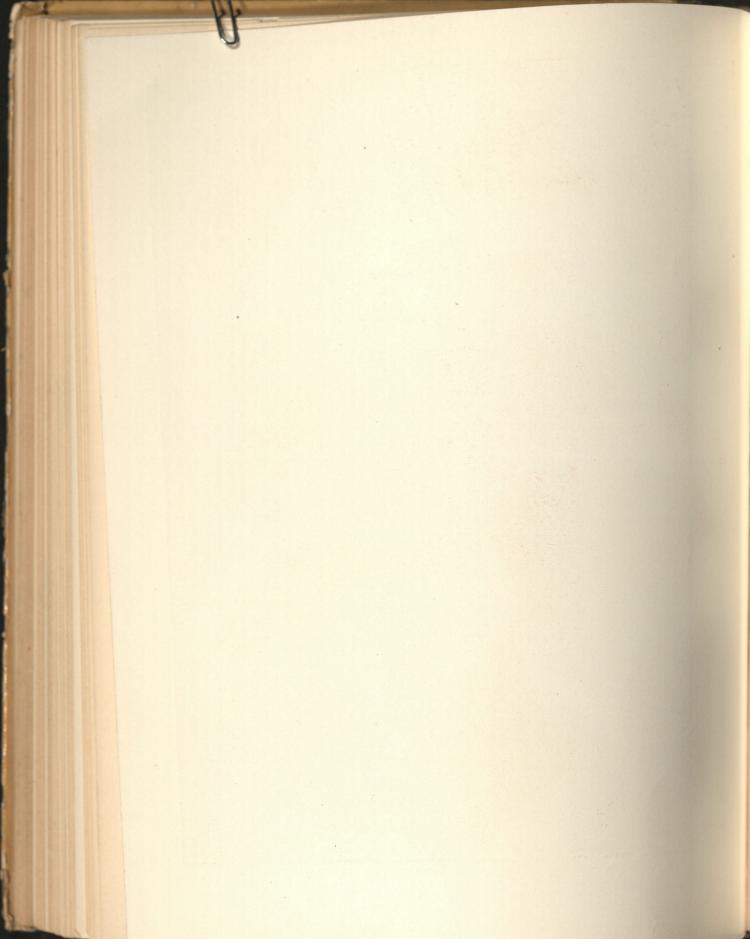
THE mice are playing hide-and-seek
Along the lines of hay;
The blackbird from his yellow beak
Pours forth a liquid lay;
The lavender is listening,
With her face towards the skies,
Where velvet bees are glistening,
With honeyed merchandise. . . .

The crying swifts are swooping
Round the church's ivied towers;
Night-loving stocks are trooping
Phantom guards of scented flowers:
And eager elves are waiting
The Moon-magician's wand—
My garden re-creating,
A fabled Fairyland.

LILIAN HOLMES.



GREETING THE NEW ARRIVALS.







WHICH CONTINENT IS THIS?

A LOST CONTINENT.

SOME one, in trying to make a silhouette map of the world, got the pieces into a muddle. They are shown on page 97. They make up one of the great continents, if you can only put them together again properly. The key is on page 128.

You can trace the pieces with thin paper, and cut them out with a fret-saw on three-ply wood, and make a jig-saw puzzle for

yourself.

'YOU NEVER KNOW ... ?

WHEN you are in a strange country you are glad of anything that looks like giving you a start, and that is why Tom Rendell had thought himself lucky when he had got a job with the Sugarpine Lumber Company, and they had put him to work with Rixon, who was one of their electricians.

For nearly a month now the two had been encamped by the side of the logging railroad, renewing a section of the telephone line that linked up the lumber camps with civilisation. In the ordinary way a month is not a very long time, but to Tom, this particular one had seemed an eternity, and he looked forward eagerly to the time when the job would be finished.

You soon get to know a man when you are working alone with him in the woods, where life is stripped of all artificiality, and it had not been long before Tom had realised that Rixon was not the kind of fellow that he would

have chosen to work with.

Apart from the fact that his company was entirely uncongenial, Tom had come to the conclusion that there was something strangely peculiar in his make-up. To begin with, why should he carry a '38 Colt revolver in his hip pocket? They were not likely to see any deer, and it was the close season, anyway . . .

Suddenly the silence was broken by the far-

off hooting of a locomotive.

'Hear that?' said Rixon. 'Guess that's the three-spot coming up the hill with empties. You'd better look busy and pull the speeder out of her way. Wonder if there'll be any mail?'

The speeder in question was a light machine made to run on the railroad, and, although possessed of four wheels, went by the name of a track bicycle. Upon the handlebars were

hung a set of climbing-irons, a string of insulators, some odd coils of wire, and a portable telephone, an instrument capable of being connected to the telephone line at any point.

As Tom pulled it further away from the track, the warning blasts became suddenly much louder, and in a few minutes a locomotive came labouring round the bend with a string of empty logging cars with a roar that echoed to and

fro across the mountain ridges.

As the train went by on its way to the lumber camps, the conductor threw out a packet of mail and shouted, 'Tom! The old man wants you to ring him up from Oak Flat right away. He's down at the Mill Office.'

'Right you are!'

Tom stuck the crowbar into the ground, and wiped his hand across his forehead.

Wonder what he wants me for?'

'Dunno,' replied Rixon. 'You'd better take a walk up to the Flat and ring through. It'll only take you a few minutes.'

'What do you say if I rig the test set on to the wire and speak from here?' suggested

Tom.

'Not worth it,' replied Rixon. 'There ain't no good place hereabouts for earthing the wire. Besides, Goodall's told you to ring him from the Flat; that ought to be good enough.'

Tom wheeled round and started off up the track. He had only spoken to the manager once. What could he want him for?

'Now just listen to me,' said the manager, when Tom had got through to him. 'The police say they have proof that the man Rixon is head of one of the toughest gangs of thieves and cut-throats on the Coast, so that it seems that it isn't just for the good of his health that he has taken a job in the mountains. A detective and a couple of men left here a quarter of an hour ago on a motor speeder, and they will arrest Rixon and bring him back here.'

'Rixon's got a gun on him, sir.'

'Well, anyway, he won't know what the game is, and I guess the detective'll know how to get the drop on him,' replied the manager. 'I just wanted to tell you which way things are going, so that you can be ready to knock him on the head if any trouble starts.'

As Tom walked back he mused vaguely on this latest turn of events. So he was working

with a man who was probably a murderer: that explained everything. The only thought that worried him was whether he was enough of an actor to keep Rixon in ignorance of his impending arrest. Perhaps a tell-tale look or a slip of the tongue might betray the truth, and if Rixon's suspicions were aroused he would be alone with a desperate man—and an armed one, too.

When he came to the place where they had been working, his train of thought was broken off just as a twig is snapped, for there in the distance was Rixon, already several hundred yards away, and pedalling for dear life on the track bicycle, which gathered speed every moment on the steep downward grade.

Uttering an exclamation, Rendell's first impulse was to start off in pursuit, but he soon realised the absurdity of chasing an armed man on a machine. So he came back to where the speeder had been, and here another discovery awaited him.

At the foot of the nearest telephone pole lay

the test set, one of the wires of which had been connected to the line above, while the other trailed away over the track in the direction of the stream, where it had evidently been earthed. In a flash Tom understood what had happened: Rixon had rigged up the test set as soon as he had started for Oak Flat and had overheard the whole of his conversation with the manager. And there were the climbing irons, just where he had thrown them after coming down the pole.

Without waiting a moment he snatched up the test set with the intention of ringing through to the manager, but on looking more closely at the instrument he found that Rixon had rendered it useless, doubtless by hurling it against the rocks after it had served his purpose.

He must get through to the manager, and quickly too. Rixon would probably cut the line, when he had got what he thought was a safe distance.

(Concluded on page 114.)

THE STORY OF COCKALOCKIE.

AFTER an exceptionally exhausting day, Cockalockie crowed his last good-night to the world at large and stumped heavily into the hen-house.

His tired legs begged him to fly up upon the roost, but the extreme dignity of his position prevented him indulging that inclination; such a proceeding would certainly be remarked upon by his household; also, they must on no account guess how tired he was.

Keeping his head high, therefore, he dragged his legs wearily up the steps of the small ladder leading to the roost, and took his place between his two favourite hens.

When his master was at home, Cockalockie and his hens had lacked nothing. Now their master had gone on holiday, leaving them in charge of a friend who knew nothing about them and cared less.

The last few days had proved exceptionally hard for poor Cockalockie. Food was scarce, and he had spent a strenuous time scraping for grubs and stray morsels for his hens.

'Times are changed,' he said to himself, as he preened his feathers for the night, 'but so long as I am able, I will search and scrape and search and scrape.' Then he closed his eyes and pretended to sleep.

Presently he became aware that his companion

on one side was restless. Then came a gentle peck at his neck and a whisper, 'Are you asleep, Cockalockie?'

He opened his eyes and discovered Buffie Brown wide awake.

'No, my dear, I'm not asleep. But why are you awake?'

'I can't sleep, I'm so hungry. Are you?'
'Not especially,' Cockalockie replied,
although he was ravenous. 'Wait until tomorrow,' he continued. 'Perhaps Farmer
Brown will plough that field then, and we'll
have a feed.'

'Oh, I do wish to-morrow would come!' said Buffie.

Just then Fluffie Facie woke up and nestled close to Cockalockie.

'You awake too, Fluffie? What's wrong with you?' said Cockalockie.

'I've had a most horrible dream about you, Cockalockie—a horrible dream.'

'Why, what was it, wifie?'

'I dreamt you were lying dead in the plantation, and——'

Cockalockie interrupted with a queer little laugh. 'Nonsense, nonsense,' he said, lightly. 'Dreams go by contraries. I'm here all right, Fluff, so don't you worry.'

Fluffie Facie nestled still closer to Cockalockie,