The Telephone
And its Inventor.

A Wonderful Story.

The arrival in New Zealand of Graham Bell, of telephone memory, was an event duly celebrated by the interviewer, who is ubiquitous. Dr. Bell was disappointing decidedly. He said things that hurt. (1) He had to all appearance got nothing by his invention, or nothing comparatively, the business side having soon got beyond him. (2) He had apparently lost all interest in the matter. (3) He gave proof of the same by the way in which he half shut his eyes to everything telephonic as he passed on his way round the world. For instance he told one interviewer that the Melbourne people are so far behind that they have not yet got the metallic circuit. But the fact is that they have arranged for the metallic circuit and it is actually being put in. He also declared that Invercargill possesses the only up-to-date system in the Dominion, and he has not seen any others. The doctor evidently let this child of his brain go its own way long ago.

The same appears to have been the case with his other brain child, aviation. He was the first scientific man of eminence to recognise the success of Langley's aerodrome and to point out what it meant to the world. In fact, when the first flight of Langley's model on the celebrated Potomac river, or rather just above its stream, was announced the doctor, who was present and saw the half mile or so done by the model, declared emphatically that the problem of aviation was solved. It remained, he said, only for the practical men to build airships on the plan of the successful model. Since then the doctor has been busy building aeroplanes for himself, and with others, and very strange things they have done. But no one seems to have known anything of this phase of the great inventor's life. He leaves the Dominion, therefore, with his light hidden under the same bushel under which it lay, so far as this country is concerned, when he arrived.

It is passing strange, perhaps a type of the unaccountability of genius, that this great scientific achiever who began life by managing a school for deaf-mutes, should now, after his vast scientific successes, be going about the world with the idea that there is only one thing in it, namely, the care of deaf-mutes. That is, perhaps, not to be surprised at, for the telephone was invented quite accidentally during experiments conducted for the purpose of making improvements in the system of teaching deaf-mutes.

We have told the story of the telephone and its discovery in these columns long ago, and our description was accompanied by diagrams of the first and the latest telephones. It is of rare interest, however, to have the doctor's own short sketch of his life and achievement, for there are lights in it not previously recorded for the benefit of average mankind. We take it from an interview in a paper published on the other side of the Tasman Sea.

"I was a Scotchman by birth, but I am a good Yankee now," said Dr. Bell to a "Sydney Morning Herald" representative recently. "I first came to America from Canada on the invitation of the Boston Board of Education. They invited me to make the experiment in their city school for deaf mutes to see whether my father's method of symbolising the action of speech could be usefully employed in teaching the deaf mutes there. My father, you see, was an inventor before me.

For Life's Sake.

"My father and my grandfather had both been by profession teachers of deaf mutes in Scotland. My father was first in Edinburgh, and then in London. He came to Canada to save my life. I had lost both my brothers through consumption, and I was given about six months to live. I was a tall, thin slip of a youth then"—Dr. Bell is now a man of big frame, sturdily built, and tall—"but the doctor thought that if I could live in the open air I might get over it. My father had no money to buy any country place there; but he said he had friends in Canada, and could get a place there. He insisted on selling all he had and going to Canada. I was utterly depressed myself. Everybody took it for granted I had only six months to live, and I thought I was going to die. But I thought that if my going to Canada was any comfort to my mother and father, it didn't much matter to me where I died.

"So I changed over to Canada in 1870, to Bradford, Ontario, and there I spent the whole time in the open air. In 1871 I was invited to Boston, and except for holidays to Bradford, I have been in the United States ever since. And it was there in Boston, three years later, that in the course of a quest which had nothing to do with the telephone, I started on the two strings of experiment which led me out upon the invention.

Early Experiments.

"It was in 1874. For a year or so previously I had been experimenting with some curious scientific apparatus, well known to scientific men, for studying the shapes of the vibrations in the air during the utterance of speech.

"Now one of these instruments is known as the 'monometric capsule' of Koenig. It consists of a cavity in a piece of wood. The cavity is divided into two parts by a membrane stretched tightly across it. One of the two chambers which are thus made is filled with coal gas. There is a little burner attached to the side which is filled with gas.

"The other chamber communicates with a speaking tube, so that when you speak into it the vibrations are communicated to the membrane, and through it to the gas, and the vibrations in the gas cause the flame to vibrate rapidly up and down. The vibrations in the flame are too rapid for observation; but, to get over that, a series of mirrors are arranged so that the reflection of the flame appears drawn out across them as a long band of blue light, and when one speaks the vibrations appear in waves along this band like the teeth of a saw. I noticed that when one spoke the various vowel sounds the teeth of this saw varied, and that each vowel had a flame of a particular shape.

"It was at the time my profession to teach deaf mutes to speak, and it seemed to me that this apparatus might perhaps be applied in teaching them—they might look at this blue flame whilst I spoke, and might learn to ascertain what I was saying by watching the flame pictures. To help me in this I wanted to photograph the flame pictures, but I found the light too feeble for that; and that induced me to try another apparatus.

The Phonautograph.

"This second apparatus was also a well-known one—the phonautograph of Leon Scott. It consisted of a cone, into which you spoke. The lower end of the cone was covered with tightly-stretched membrane. Hinged on to the edge of this membrane was a long lever of wood, which was also connected with the centre of the membrane by a little 'bridge.' At the end of the wooden lever was fixed a little pig's bristle, which was placed just above the surface of a sheet of glass covered with lamp-black. When you spoke into the cone the vibrations of the membrane moved the lever, and the pig's bristle scraped a line in the lampblack, which was arranged to move beneath it.

"On speaking into this instrument I again found that each different sound seemed to have its own shape of vibration, and they could easily be photographed—which was what I wanted for my teaching.

"However, when I came to compare the vibrations made by the phonautograph with those made by the flame apparatus I found they did not tally. The same sound gave very different shape. I reasoned from this that the phonautograph, which was a rather crude instrument, had distorted the vibration. I wanted to see how I could perfect it. In considering this it struck me that its mechanism was wonderfully like that of the human ear, and that if we could keep the mechanism of the human ear in the phonautograph we should get better results.

The Human Ear in Experiment.

"To help me to get ideas in approximating the phonautograph to the ear I went to a distinguished aurist in Boston, Mass., Mr. Clarence J. Bake—and he fairly startled me. 'Why don't you try a human ear from a dead man as a phonautograph?' he said. 'That's a very interesting suggestion,' I replied. 'I didn't think of such a thing. I should be very glad to get one.'

"He got an ear of some man who had just died, and gave it to me.

"I was then living near Boston, but every summer I used to go for a holiday to my father's residence in Bradford, Canada. Well, I went there that summer of '74 and took the human ear with me. I experimented with it there as best I could away from the facilities which I should have had in the States, and got the most beautiful tracings.

"I was carrying out these experiments so far purely as part of my profession, the teaching of the deaf and dumb in the United States—that is to say, when the dumb existed, for there are no longer dumb in the United States: 75 per cent. are now taught to speak. I had reached the stage of studying the vibrations of the human ear, and I had now got a beautiful tracing of those vibrations.

Quite Another Chain.

"Quite apart from those experiments to help me in teaching, I had also been engaged for some years on an experiment