

My Radium Finds: I had no radium until a Mæcenas gave me funds for a small quantity . . . All went well. Other results came tumbling out. I knew I had made a discovery."

&S a very small boy I went to the school in the Cumberland parish of which my grandfather was vicar. My father had been to sea for many years, but had settled down to farming. After a year or two there, I was sent to the grammar school at Market Harborough. It is one of my vivid memories of that time that the headmaster used to read out each morning the telegrams from the Franco-German war.

Six years later I went to King William's College, in the Isle of Man, where I had the good fortune to be under a really good mathematical master, D. D.



From a caricature by Matt Jenkins by name, who decided my leanings towards mathematics, though in those days classical subjects filled the

greater part of the time table.

In 1881 I went as an exhibitioner to Trinity College, Cambridge, and set myself to work hard for the mathematical tripos. I came out Third Wrangler.

Then came an incident which may interest my readers. I was walking along the King's Parade one morning with the present Master of Trinity: he was on his way to give a lecture and I on my way to hear it. He asked me if the Senior Wrangler of my year was in for the vacant professorship in mathematics and physics in the University of Adelaide. I said that to the best of my belief he was not. But the question set me thinking. It would not have been asked unless the Senior Wrangler in question was an eligible candidate, and if he was, and was not applying, I might have a chance. I knew no physics, it was true, but then I knew the other had not had any laboratory experience. So the moment the lecture was over I telegraphed an application to the Agent-General in London.

ADV. 26 5.26 ACCOUNTANTS' DINNER. A UNIVERSITY CHAIR SUGGESTED.

wealth Institute of Accountants gave a dinner at the South Australian Hotel on Wednesday night in honor of the inter-

In a few days I was sent for, and in three weeks I was on board the old Rome, 4,500 tens, the leading ship of the P. and O.

The voyage was great fun. Of course, I had to learn some physics on the way: I was going to be Professor of Mathematics and Physics, and however much my degree qualified me to teach the former, the latter was very much an unknown world. In Adelaide it turned out that there was only one elementary class of respectable numbers and a little class of two students who were rather more advanced; and I managed to keep in front.

Sometimes I had queer experiences. There was so much to do in the two subjects that I did not always have the time to rehearse before the lecture the experiments which the laboratory assistant had prepared. But my trust in the reliability of physical laws was always justified. On one humiliating occasion I asked the assistant if he could get me some sodium chloride for an experiment, only to discover a little later that the substance was common salt.

For seventeen years I worked steadily in Adelaide. Then came another crisis. It had never entered my head that I should do any research work. I was to give the presidential address to Section A of the Australasian Association for the Advancement of Science; the meeting was in Dunedin, New Zealand, in January, 1903. I thought that I could make an interesting address if I spoke of the recently discovered electron and of the phenomena of radioactivity.

While reading up the subject, I came across some results described by Mme. Curie which seemed to me capable of only one interpretation, and that an interpretation which had not yet been suggested. It was known that when the radium atom broke up into two parts, one large and one small, the latter, which was really an atom of helium, was driven into the surrounding air, and these particles constituted what was called the "alpha" radiation. Mme. described experiments which implied that all the alpha particles thus expelled went about the same distance.

This interested me extremely. All ordinary radiations fade away gradually with distance; the alpha particles seemed to behave like bullets fired into a block of wood. But, if this were so, the particle must travel in a straight line through the air, as the bullet does through the block. Now, some hundreds of thousands of air atoms would necessarrly be met with on its journey. How did it get past? It could not push them to one side, for it was smaller than they, and the simplest experiment on the billiard table shows that a ball will not go straight through a crowd of others however hard it is hit. It could not dodge from side to side, continually recovering its original direction: that

don. (Continued on page 848) together.
together for the general good. They should other very materially. He spoke of Ade-

Mr. A. L. Slade (president of the South ever branch they belonged they all had Australian division) presided over a large the advancement of the profession at the unavoidable absence of Sir Archibald submitted "Our Guests," in a brief speech, Mr. H. H. Austin, vice-president of the be forced. It would come gradually and accountants had been in court, and they Adelaide Chamber of Commerce, responded naturally. As soon as they could speak were certainly a learned body. He al- and referred to the accountants as an im-Institute of Accountants." The corpora- would have more weight. They had now one coherent body which, for one thing so that they were given ex-official repreof accountants in Australia, and sedulous of monwealth, and it was necessary that they was no reason why the accountants should As a commercial man, he could say that

IN THE DAYS OF MY YOUTH

(Continued from page 834) would require that the particle should be possessed of intelligence.

There was only one answer to the problem. The particle must go through the air atoms that it met. There must be a moment when two atoms, the alpha particle and the atom being crossed, occupied the same space. This was contrary to all the teachings that I knew. Still, it seemed to be right; and, as a matter of fact, it was right. So I gave my address at Dunedin and explained this point in the course of it. I had never tested the hypothesis by any experiment, for I had no chance of making a test. I had no radium.

When I got back to Adelaide I was given the funds for the purchase of a small quantity by Mr. Barr-Smith, a Mæcenas who often befriended scientific work, and so I was able to try my special experiment, and all went well. Indeed, many other results came tumbling out, all of which fitted in with the new radioactivity discoveries made by Rutherford in Canada. I found that helium atoms of four different "ranges," as I called them, were shot out from the radium preparation, which must belong to the four different active substances that Ruther-

ford had shown to exist. Then I got a hint from Professor Soddy, who was passing through Adelaide, that I should dissolve the preparation in water, which would wash away three of the active substances but leave radium itself, the parent of them all. So I did, but, horror of horrors, as I brought my measuring apparatus up towards the radium in the way I had learnt to do, there was no radiation at all when I was well within the old range. However, with a very downcast spirit, I pushed the apparatus closer still, and closer; and suddenly a tremendous effect flashed out. The radium itself sent out the particles of the shortest of the four ranges, not the longest as I had thought; and, free from overlying impurities, was shooting with great effectiveness. My assistant, Dr. Kleeman, and I were

So I wrote to Rutherford in Canada. It seemed a very long while to wait the necessary three months for an answer. I knew I had made an important discovery. and it seemed, surely, that someone must stumble on it before I could get in from the other side of the world I was away in the country when the answer might be expected. The coach that brought the mails used to appear on the skyline of the hill at four in the afternoon, and for many days I went to the post office hoping for the reply. At last it cam, and all was well. How pleased I was! And I have never forgotten that Rutherford took the trouble, in the middle of all his own exciting discoveries, to write so promptly to someone unknown.

excited enough!

After that, research work was part of my daily life, of course. I accepted invitations first to Leeds, and then after some years to London. And I have had the great happiness of sharing the work of my son on the X-ray analysis of crystals. When he had finished his courses at Cambridge and was looking for work to undertake, I suggested to him that he should examine thoroughly the new discovery of Laue in Germany It was then that he found a certain method of looking at that discovery which led to the researches we have carried on WILLIAM BRAGG.

also stand firm and try to get some kind laide having taken a leading part in the ness, and required a great deal of learns of a charter which should apply to all establishment of a commercial course at ing. If the university were to undercompetent accountants, and not to any the University, and there were now 341 take any work for the accountants, it particular section. They must do all they students attending the lectures. He fav- must have the support of the profession could to make the profession one to be ored the founding of Chairs of Commerce, and the public in general. Then money reckoned with. He favored the establish- and hoped some donations would in future was necessary for the proper carrying out ment of a Chair of Accountancy at the be earmarked with such an end in view, of the task, and benefactors should be The Adelaide council of the Common-University of Adelaide, (Applause.) As an institute they realised the value induced to inrnish the funds. The ac-Mr. L. A. Cleveland, president of the of such chairs, which were desirable in countants must take to their own members institute, responded, and said that body the interests of the State generally, and the necessity for making available the rerecently celebrated its 40th birthday. It the business community in particular. He sources which they were competent to was first of all a State body, and the assured the university of the support of use for such purposes as the institute, or State representatives of the General Coun- first Institute of Accountants was formed the institute in any movement put forth, kindred bodies, might think best. Ap-

upheld the honor of the profession. He should get in touch as much as possible, not do the same thing. The university more and more the accountants were reof accountants so that they could present a Mr. H. P. Ogilvie, vice-president of the by the man in the street. It was the branch of the business community. He ment between the different associations Adelaide." He said the university and late all the available knowleds being engaged in the comment

cial houses. As a body they were ing dignity to the profession, armity could rely on the commercial contain their power. (Applause.)
Mr. R Duncan, president of 10 TO. ber of Manufactures, in his wunt. marked that he always regar ants as the safety valve of b favored able men of figur business advisory boards. Mr. F. Blamey, vice-pre Federal Institute of A

replied. Mr. Gordon James say lent songs during the eve