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On Sunday last Mr. Frederick Bevan was commanded to attend the service at Marlborough House Chapel, and afterwards the private service for the King and Queen at Buckingham Palace. To be present at the latter service may be considered a great distinction, and it shows that Mr. Bevan's membership of the Chapel Royal has not been forgotten, although he has been so long absent in Adelaide. Mr. and Mrs. Bevan had the honour of dining at St. James's Palace on Tuesday last. This week Mr. Bevan attended the installation meeting of the Cathedral Lodge of Freemasons—the lodge attached to St. Paul's—and renewed his acquaintance with Archdeacon Sinclair and several other eminent men, both ecclesiastical and musical. On Wednesday he spent a pleasant half-hour with Mr. Frank Thornton, the inimitable "Private Secretary." To-day Mr. and Mrs. Bevan left for Eastbourne to stay with relatives.

Miss Ethel Hantke had a most successful first appearance at the Royal Academy concert on Saturday last. She sang Goring Thomas's "My heart is weary," and created a deep impression—a considerable distinction for a student who has so lately entered the Academy.

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ELECTRON AND ATOM.

PROFESSOR BRAGG'S SECOND LECTURE.

The second of the three lectures by Professor Bragg on "The electron and the atom," delivered at the University of Adelaide in connection with the extension series was given in the Prince of Wales Buildings on Tuesday evening. Every seat in the auditorium was occupied, and the professor was accorded a cordial reception. The professor said, in opening, that they proposed to discover what might be learned as to the nature of the atom from the phenomena of radio-activity. Some years ago Professor J. J. Thomson said that it was possible to detach from any atom a very small portion called an electron. That was a negative charge. The remainder of the atom was therefore left positive. Various agencies could break up the atom in that way. Such charge centres were called ions, and a gas containing them was said to be ionized. The attraction of the electric charges was generally sufficient to cause neutral molecules to cluster around them so that the ions in a gas became molecule clusters. Electricity could pass through such a gas, because the negative ions moved one way and the positive ions moved the other. From whatever source it was derived, the electron was always the same in charge and mass. Electrons being so light were very easily moved, and in even moderate electro-motive forces acquired enormous speeds—tens of thousands of miles per second. Electrons moving with such speed were to be found in the ordinary vacuum tube. When an electron was suddenly stopped the shock caused ether waves to ripple away from the point of impact. Those were known as Rontgen rays. Radium gave out three totally distinct kinds of radiation. Two of them were radiations of matter; the third was of short pulses in the ether. Of the two former one was a radiation of matter of the size of atoms, the other of electrons. There were many substances which gave off small amounts of phosphorescent light when struck by rapidly moving electric charges. Radium was one of those, and therefore actually gave out a small amount of light under the impacts of its own projected particles. The radiations of matter from radium formed the new and deeply interesting phenomena which were so much studied at present. In the first place they had remarkable powers of penetration through substances; in the second place they moved with enormous speed. Since the electron could pierce a yard of air without being bent aside it followed that, being very light, it encountered nothing on the way. Yet it had gone through many millions of molecules. They were therefore driven to the conclusion that a molecule or atom was largely empty space, only a small portion of the region it claimed as its own being actually occupied by anything capable of resisting the impact of an electron. If, as was now supposed, the principal portions of an atom were its electrons—if, as seemed probable, they and they alone constituted what they called the mass of the atom—then it seemed certain that an atom contained a quantity of electrons in rapid motion around some centre and with wide spaces in between, to be compared with the motions of the planets around the sun and the great distances which lay between them. The alpha rays of radium consisted of matter of the size of atoms, and it appeared that they also could pierce other atoms without being stopped or suffering any marked deflection. So that it would almost appear as if when a certain speed had been exceeded atoms no longer rebounded from each other on meeting, but passed through each other. Similarly, electrons might pass through atoms. That critical speed was about 6,000 miles per second. It was that speed which was reached by certain rays in vacuum tubes, and by the particles projected from radium. Professor Bragg used some of the radium which he recently received from England in conducting his experiments, with which he illustrated and assisted his lecture. He promised that in the third address he would consider the nature of the processes involved in the extraordinary breaking up of the radium atom. At the conclusion of the lecture the professor courteously permitted persons in the audience, who were curious regarding the appearance of radium, to inspect his valuable samples, and he had the room darkened so that they might see through a screen the peculiar glow which emanates from the substance.

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ANGAS SCHOLARSHIP OF ENGINEERING.

The Angas Scholarship of Engineering, worth £200, for two years in the gift of the University of Adelaide, has been won by Herbert William Gartrell, B.A., B.Sc., formerly of St. Peter's College. Mr. Gartrell, who is 21 years of age, took his degrees in 1902. He was awarded a Government Education Scholarship, worth £35 annually, for three years, in 1899, on the results of the senior examinations. The Angas scholarship is competed for triennially, and the examination includes the following subjects:—Mathematics, physics, geology, chemistry, applied mechanics, and mechanical and engineering drawing. The successful graduate has submitted for approval by the council a list of institutions, in one of which he proposes to continue his studies, and it is probable that he will proceed to America in preference to England, whither previous students have gone.

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MISCELLANEOUS NEWS.

UNIVERSITY EXTENSION LECTURE.

His Excellency the Governor and Lady Le Hunte were present at the University lecture-room on Tuesday night, when Professor Bragg delivered the third of his extension lectures on the Electron and the Atom. There was a large attendance. The lecture was supplementary to those previously delivered, and of a highly technical nature. Professor Bragg showed that the "Beta" rays of radio-activity were of different velocities, and proved this by showing their behaviour under magnetic influence. They were possessed of enormous penetration, being able to affect a photographic plate in a metal envelope. Lantern slides were exhibited showing the effect of radio-rays on a plate exposed to the shadows of a key, a ring, and a piece of platinum. The lecturer thought that the presence of radio-activity in the atmosphere was responsible for the varying "moods" to which human beings were subject. Electrons were the centre of moisture clusters, as steam or clouds, and this was shown by an experiment with a steam jet, influenced by an electric current. Professor Bragg showed that uranium was more easy to experiment with than thorum or radium, as it was less complex in its nature, and he showed the various emanations of "Alpha" and "Beta" rays, and their subdivisions, from the three radio-activities. Radium atoms were the heaviest of which we have any knowledge, and it was curious to note that radio-activity was the reverse of chemical evolution, for in its emanations it evolved from a complex state to a more simple one, while in ordinary evolution the process was from simple to complex. It was possible, the lecturer thought, that radio-activity might have an effect on the geologically arrived at conclusions as to the age of the earth. The lecture was made as simple as possible, with experiments, and listened to attentively, and at its close Professor Bragg received a well-earned round of applause.

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UNIVERSITY EXTENSION LECTURES.

MR. SODDY ON ELECTRICITY.

Last night at St. George's Hall, Mr. F. Soddy, M.A., delivered the first of a series of lectures on "Modern Views on Electricity and Matter."' Not only every seat but also every available inch of standing-room was occupied, and many season-ticket holders were unable to obtain admission.

Dr. Hackett, who presided, briefly introduced the lecturer to the audience.

Mr. Soddy, who was received with loud applause, said that he was very glad when he received the invitation to come out to Australia. That evening he would endeavor to give them some idea of recent discoveries with regard to electricity—some views as to its nature, and the way in which it operated. If they asked him what electricity was, he could not answer them exactly, any more than he could tell them what was gold. He did not hope that any adequate explanation would be arrived at. He rather wished that his lecture could have been postponed for 10 years. Many useful workers were engaged in different fields, and they got results, each marking a great advance, but these results were not yet correlated. It was Benjamin Franklin who first drew the spark from the clouds. His theory was that electricity was a fluid—that is, "something that flows." Electricity was, however, not an ordinary fluid, for it did not pass through air, though it did pass through solid material, as, for example, cables.

He then showed an experiment with a storage battery of two cells, each of four volts—the unit of pressure being a volt. If he placed his fingers on the two poles it did him no harm, because the current was too weak. Applying successively currents of four, eight, 12, and 16 volts to a wire, he showed that the stronger the current the brighter was the glow of the wire. The pressure of the town main was 220 volts, and with this pressure he proceeded

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to ignite a "Nernst" lamp. With a current of 60 volts it was possible to "strike an arc." He explained the principle of the arc lamp, and pointed out that at high temperatures the air was conducting. He then described Faraday's great discovery of 1830—that "induced currents" could be produced by means of a magnet. Connecting a coil of insulated wire in circuit with a galvanometer, he showed that when a magnet was rapidly inserted into the hollow of the coil a momentary current was induced, and when it was rapidly pulled out the current moved in the opposite direction.

Faraday's discovery led on to the discovery of the induction coil, and many other important things. The electric light, for example, was furnished by dynamos, which were worked by induced currents. Yet, when Faraday showed his experiment at a lecture in London, he was asked afterwards "What good is it?" He replied, "What good is a baby?" Some might ask at the present time, "What good is Radium?" At present it was impossible to say what use might not ultimately be made of it. It was a matter of extreme importance that every nation should encourage a spirit of scientific investigation, though it might not be possible to see any immediate prospect of material benefit. An induction coil was an apparatus for converting an electric current at a low pressure into a smaller current at a high pressure. It consisted of a cylindrical bobbin having a central iron core, surrounded by a short inner or primary coil of stout wire, and by an outer secondary coil consisting of many thousand turns of very fine wire, and there was a contact-breaker for making and breaking the circuit rapidly. The same principle of an interrupted circuit was to be observed in the electric bell. He produced the spark from the induction coil, and showed that, when two Leyden jars (which he proceeded to describe) were connected with the two terminals, the discharge was different, owing to the oscillation of the current between the two jars. Electricity had many of the properties of matter, especially the property of inertia—that when it was set in motion force was needed to bring it to rest. By means of a small electric motor he set a disc rotating so rapidly that the pattern—black on white—was indistinguishable, and the color appeared to be uniformly gray. Then, to show that the electric spark was absolutely instantaneous, he had the lights lowered and turned on the spark, when the pattern was as plainly seen as if it had been at rest. If they had ever seen a train by a flash of lightning they would see every spoke of a wheel distinctly. He had seen Niagara by lightning, and the torrent appeared to be motionless, as though carved out of marble. The time-duration of the spark could be measured, even though it might be only a millionth part of a second.

He concluded by conducting an interesting series of experiments with a "high frequency" apparatus (such as was used by doctors in the treatment of disease), containing two Leyden jars, connected by a spiral. He passed the current through a copper rod in the form of an inverted "U," and showed that when a high-resistance lamp was placed between the two limbs, near the base of the "U," the current passed through that lamp, instead of taking the easier path along the rod. He also ignited a lamp, one end of which was grasped by himself and the other by Mr. Hancock, so that the current passed through their bodies, and he illustrated the effect of the current on a globe containing argon and another containing air.

At the close of the lecture, which was followed throughout with the most intense interest, Dr. Hackett said that their warmest thanks were due to Mr. Soddy for his most instructive and interesting lecture. He was sorry that so many had been unable to obtain admission. This was a new experience at their University Extension Lectures. He hoped that one or two extra lectures would be given for the benefit of those who had been shut out that night. He would ask Mr. Soddy to convey the thanks of the meeting to Dr. Roberts, the secretary of the London University Extension Committee, and to the representatives of the Gilchrist trustees, for material assistance and sympathy.

Mr. Soddy having briefly acknowledged the applause of the audience, the proceedings terminated. Among those present were Lady Bedford and a party from Government-house.

We are informed that arrangements will be made, if possible, for Mr. Soddy to repeat last night's lecture before Friday evening. Full particulars as to when this lecture will be given will be published in to-morrow's issue. For the rest of the series of lectures seats will be reserved for the season ticket holders.

To-night Mr. Soddy will lecture at the Victoria-hall, Fremantle. The Mayor will preside.