or habits have a greater chance of persisting. The existence of a number of islands has promoted non-adaptive differentiation of island subspecies, from which species have been evolved when two such forms have later met in the same area and kept distinct. The genera show a minor adaptive radiation. The loss of male secondary sexual plumage is correlated with its ceasing to function in specific recognition.

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OBITUARY

Sir Oliver Lodge, F.R.S.

BY the passing of Oliver Joseph Lodge the world has lost not only one of its most distinguished scientific investigators, but also one who had unique powers of exposition able to make clear to minds of less ability than his own the nature of new scientific discoveries or novel scientific conceptions in lucid and original language.

Lodge was born at Penkhull near Stoke-on-Trent on June 12, 1851, where his father had a business connected with the pottery trade. His school education was gained at Newport, Staffs, and it was intended that he should enter his father's business, which he did for a short time at fourteen years of age. But he soon exhibited a keen interest in science and disinclination for a business career. By private study he acquired sufficient knowledge to matriculate in the University of London and then to pass the intermediate examination for the B.Sc. degree.

At that time the Science and Art Department had a scheme for giving promising students and elementary science teachers an opportunity of gaining practical laboratory training under distinguished men, and the science schools at South Kensington had been opened for that purpose in 1872 with Edward Frankland as professor of chemistry, Frederick Guthrie for physics and Thomas H. Huxley for biology. Both Lodge and I took advantage of this opportunity and thus commenced a life-long friendship. We were both more interested in physics than in pure chemistry. Crookes had then begun, and was continuing, his researches on electric discharge in high vacua. Clerk Maxwell published in 1873 his great treatise on electricity and magnetism and had translated into mathematical form Faraday's original ideas concerning the electromagnetic field. We were both extremely interested in Maxwell's conceptions on electromagnetic waves. To gain additional knowledge of physics and mathematics Lodge entered University College, London, to study under Carey Foster in physics and mathematics with Henrici, but his abilities soon enabled him to pass from the state of student to that of teacher. After taking his B.Sc. degree he became reader of natural philosophy in Bedford College for Women in 1875, and in 1879 assistant professor in applied mathematics in University College, London. In 1881 he was selected as professor of physics in the University of Liverpool and soon began to make a name for himself as an original investigator.

Lodge's powers of exposition led to invitations to give lectures or courses at other places. He gave a lecture at the Royal Institution on the discharge of a Leyden jar in which he pointed out the importance of resonance or tuning when dealing with electric oscillations. In a lecture course at the Royal Society of Arts he discussed the nature of lightning discharges and surmised that they might consist of high-frequency electric discharges. This study led him to devise experiments on the propagation of electric waves along wires and he came very near to anticipating the work of the German physicist H. H. Hertz on the production of Maxwell's electromagnetic waves in space.

Hertz's work was carried out at Karlsruhe and Bonn between 1885 and 1888. His masterly experimental work on this subject excited world-wide interest. Lodge threw himself with the greatest enthusiasm into the work of repeating and extending that of Hertz. Lodge devised experiments to show the similarity between optical effects such as refraction and reflection of light and those of electromagnetic waves. This prepared the way for his original work on wireless telegraphy. Hertz had employed as a detector of electric waves a simple ring of wire with spark balls inserted in it. But this was not at all sensitive. Lodge adapted for that purpose a tube loosely filled with metallic filings which in that condition was a poor electric conductor. But the impact of electric waves on it caused a coherence to take place between the metallic particles and hence Lodge named it a coherer. If given a slight tap the filings came back into the non-conductive state and accordingly Lodge made a self-acting tapper on the principle of the electric bell which continually restored the filings to a state of poor conduction.

Hertz died in January 1894, and in June of that year Lodge gave a brilliant lecture at the Royal Institution on the work of Hertz. No mention was made of electric wave telegraphy in that lecture; but, using his coherer, experiments were shown illustrating the production, detection, and properties of electric waves. In the autumn of that year Lodge

repeated the lecture before the British Association at Oxford and on that occasion he showed that with a deadbeat Kelvin galvanometer long or short deflections of a spot of light could be created by means of a Hertz radiator in a distant room. Thus Morse code signals and intelligence could be transmitted. By the use of a more powerful radiator, Marconi covered miles instead of yards. In a British patent taken out about this time, Lodge pointed out the necessity for syntony or tuning between the transmitter and receiver. This patent later on became of great importance and was acquired by the Marconi Company. In conjunction with Dr. Alexander Muirhead, Lodge worked out later on a complete plant for wireless telegraphy. He must therefore be considered as one of the pioneers of this important application of experimental research.

Lodge was, however, more interested in pure research than in its applications. He had a firm belief in the actuality of a space-filling ether and endeavoured by various experiments to prove a connexion between matter and ether, but without results. He expounded his views in various papers and books, for example, "Modern Views of Electricity", "Electrons", and "The Ether of Space".

In 1900 he was chosen as first principal of the University of Birmingham, where he remained for nearly twenty years, and by the breadth of his interests and personal character he made himself known and beloved by an extensive circle.

Lodge was knighted in 1902 and was the recipient of numerous honours, such as the Rumford Medal of the Royal Society in 1898 and the Albert Medal of the Royal Society of Arts in 1919. He was elected fellow of the Royal Society in 1887, and president of the British Association in 1913.

His personal appearance was impressive. He was 6 ft. 4 in. in height and in middle life had a strong facial resemblance to a former Lord Salisbury. He always commanded serious attention in any meeting at which he spoke. He was happy in his domestic life, and had a large family of six sons and six daughters.

Lodge became prominent as a leader in psychical research. In common with his friend F. W. H. Myers, he had a strong conviction of the survival of some part of the human personality after the death of the bodily organism, and he sought to prove it in various ways. The writer is not, however, qualified to evaluate Lodge's work in this region. His attention to it was not the outcome of mere scientific curiosity but of a firm belief in the value of human life and the eternal consequences of human conduct. Above all he did not consider the universe to be the outcome of an automatic evolution but the creation of a Supreme Intelligence. He had a serious and reverent outlook on human life and his wide and valuable work in numerous fields will ensure for his name an enduring recollection as well as an affectionate remembrance by many minds.

Sir Oliver Lodge died on August 22, at Normanton House, Lake, near Salisbury, where he had lived for many years.

AMBROSE FLEMING.

I FIRST met Sir Oliver Lodge about the year 1877 when he used to come to South Kensington for the May examinations of the Science and Art Department. At that time the Physical Society used to meet on Saturday afternoons, and the meetings were very different in character from what they became when the time of meeting was changed to Friday afternoon. They were less severe, and the friendly and almost chatty atmosphere of a tea party prevailed. Lodge was very much at home on these occasions, and he was always listened to with interest. His clear speaking and characteristic and musical voice and originality of view made his contributions to the discussions valued and attractive.

The subjects ranged over the whole field of the classical physics of that epoch. I remember in particular one source of much discussion—the seat of electromotive force in the voltaic cell. Lodge had a great deal to say on the apparently erratic behaviour of lightning, which did not seem to understand the clear rules of behaviour set out in the text-books. He devised and showed experiments based upon the idea, so far as my very imperfect memory goes, that the stroke came direct not from a great mass of cloud but from a region suddenly charged by a discharge from the cloud, which seems to approach the step-by-step action of the leader-s roke discovered by Schonland. It so happens that I have seen very little of Lodge during the last thirty years, but I was very glad, when my premises were visited by a peculiarly freakish flash (see NATURE, **131**, 765; 1933), to get him to come over and see what had happened. It may be worth while mentioning that the black Italian poplar tree struck is still doing well, having an edge of growing cambium encroaching over the stripped trunk four inches thick.

I do not know what attitude Lodge assumed towards games and sports in general. I remember, however, taking part in a game in his house in which he excelled. It is quite likely that he invented it. A string or tape is stretched across the hall to serve as a tennis net, and the players at very close quarters beat with their flat hands an ordinary child's india-rubber balloon over the net. This may sound a mild pat-ball style of game, but actually it is most strenuous. By giving well-directed glancing strokes the ball is made to spin and advance very rapidly, but owing to the rotation its motion seems as erratic as that of lightning—it may even loop the loop—and it is a very difficult matter to return it at all. I like to conclude this very short and imperfect personal note with the picture of Sir Oliver towering behind the net, with smiles all over his face, and with his long reach and his firm and well-directed slicing strokes enabling him to harass his opponent.

C. V. BOYS.

WE regret to announce the following deaths:

Prof. C. C. Caleb, formerly professor of physiology in King Edward's Medical College, Lahore, on August 26, aged seventy-nine.

Prof. W. Lash Miller, C.B.E., emeritus professor of physical chemistry in the University of Toronto, on September 1, aged seventy-three.