

Dr. P. Eggleton's paper dealt with some aspects of this very difficult subject.

If a dead muscle is suspended in Ringer's solution, dissolved substances can diffuse freely into the whole of the water of the tissue. When the muscle is alive, most electrolytes can diffuse into one third only of the water it contains; the remaining two thirds are inaccessible to them. Glucose also has access to one third only, but urea can diffuse freely throughout. Histidine can diffuse throughout, but not its derivative carnosine. It is impossible at present to understand the partitioning mechanism underlying these facts, but some mechanism there must be.

The electrical potentials that are developed at cell surfaces are generally believed to be due to unequal concentrations of electrolytes on the two sides. The frog's skin develops such a potential between its two surfaces, but only so long as

oxidative chemical reactions are going on, presumably to provide energy for maintaining a concentration gradient. Mr. O. Gatty has found that specific types of chemical reaction are necessary for this purpose, and is endeavouring to work out their course in detail.

Mr. J. S. Mitchell's experiments have been concerned with a rather special problem, the chemical changes in proteins brought about by ultra-violet light; but the method used is one of very general interest and great importance. It is to study the process in monomolecular films spread on a water surface. In such films the molecules can be definitely orientated and molecular structures and transformations may be studied directly. Many important cell constituents and other substances of biological interest can form monomolecular films, so that this very powerful method can be applied to them.

A. D. R.

Obituary

Dr. J. B. Charcot

THE wreck of the polar yacht *Pourquoi Pas ?* in a furious gale on the coast of Iceland on September 16, with the loss of all on board but one, was a tragic but not an inglorious end to a famous ship and to the life of the brilliant explorer whose career was so closely bound up with her for nearly thirty years.

Jean Baptiste Charcot was born in 1867, the son of a famous physician and neurologist, Prof. J. M. Charcot. He studied medicine in Paris and was for a time an assistant in the Pasteur Institute. Although he published several papers on medical subjects which were not without merit, circumstances determined that his reputation was to rest not on his professional achievements but on the outcome of his devotion to the sport of yachting.

Charcot's love of the sea brought him under the influence of the revival of polar exploration at the beginning of the present century and fired him to take a part. He raised funds for the purchase and equipment of a small ship, renamed the *Français*, for an arctic voyage, but changed the scene of his exploration to the Antarctic and sailed in 1903 with the intention of searching for the missing expedition of Otto Nordenskjöld in the Weddell Sea. When in South America he heard of Nordenskjöld's relief, and took the *Français* to the west side of Graham Land, there to continue the work begun by Gerlache in the *Belgica*. He reported the existence of Loubet Land south of Graham Land, and pushed on within sight of Alexander I Land; but the main value of the expedition lay in the physical observations and natural history collections made with the aid of his efficient scientific staff during two years.

On his return, Charcot secured Government support for a second expedition, and after a close study of the British, German and Norwegian polar ships, he had the *Pourquoi Pas ?* designed to unite the best features of them all. In her he cruised for two years, 1908-10, to the west and south of Graham Land, giving precision to the somewhat nebulous lands seen from the *Français*. He explored the coast of a large island south of the Antarctic Circle to which he gave the name of Adelaide Island, believing it to be an extension of the small island so named by Biscoe in 1832. South of Adelaide Island he discovered a large inlet which he named Marguerite Bay and a new land south of Alexander I Land to which he gave the name of his father. These lands he could not approach, and he believed them to be islands lying off the Antarctic continent. As on the previous expedition, the main value of the researches on the *Pourquoi Pas ?* came from the very extensive series of magnetic, meteorological and oceanographical observations and the collections of geological and zoological specimens.

After completing the publication of his results, Charcot continued to make oceanographical summer cruises in the *Pourquoi Pas ?*, especially in the Greenland Sea and along the west of Scotland. He was one of the very small number of sailors to effect a landing on the remote islet of Rockall, 185 miles west of St. Kilda, and he acquired an intimate knowledge of the complex coasts of the Outer Hebrides. At the beginning of the Great War his Government insisted on placing him in the Army medical service, but he succeeded in proving that he was a better sailor than a surgeon, and received a commission in the French Navy. Later he was given command of

a British vessel with a combined French and British crew, and in her he rendered valuable service by preventing the establishment of enemy submarine bases in the desolate harbours of the west of Scotland which he knew so well.

After the War, Charcot continued to visit East Greenland on summer training cruises with young French sailors. He made a trip to Scoresby Sound in 1931 to select a site for the French station for the Polar Year observations of 1932-33, and afterwards transported the party of French physicists to and from the Sound. He rendered willing and efficient help to many of the recent Greenland expeditions. To young explorers Charcot was always a generous friend and a wise counsellor, and he gave the full benefit of his experience to Mr. Rymill of the British Graham Land expedition which is now in the field.

Charcot was a man of great personal charm and high culture. His literary style was clear and graceful, and his speeches on his many visits to England were always bright and to the point, for he had a perfect command of the English language and a gift for making enduring friendships. Apart from his scientific writings and his polar narratives, he was the author of a very attractive book on Christopher Columbus in which historical critics recognized the value of the interpretation of Columbus's voyages by a scientific man with a practical knowledge of seafaring.

Charcot's genius won for him full recognition as a leading man of science both at home and abroad. He was a member of the Institut de France and of the Academies of Sciences and Marine, received the gold medals and honorary membership of all the chief geographical societies of the world, and at the time of his death was president of the Paris Geographical Society.

HUGH ROBERT MILL.

Dr. A. Anderson

DR. ALEXANDER ANDERSON, whose death at the age of seventy-eight years occurred on September 5, was a physicist and mathematician of note. He was professor of experimental and mathematical physics at University College, Galway, for almost fifty years. He was one of the last holders of the joint chairs of experimental and mathematical physics, a distinction shared with Prof. Morton of Belfast, who paid a graceful tribute to him in *The Times* of September 10.

Dr. Anderson was born in 1858. He studied in Queen's College, Galway (as it was then called), and graduated in 1880. He won an entrance scholarship to Sidney Sussex College, Cambridge, in 1881. He was sixth wrangler in 1884. After a short period in the Cavendish Laboratory under Sir J. J. Thomson, he was appointed professor at Galway in 1885. He became president there in 1899 and held both offices until his resignation in 1934.

Anderson is perhaps best known for his method of measuring self-inductance, which is in general use in laboratories of physics and electrical engineering. Two other of his methods have become standard practice, namely, his method of measuring surface tension and his method of measuring the viscosity

of a gas. From 1890 onwards he published many papers in experimental and mathematical physics on optics, electrostatics, electromagnetics and relativity. Of his researches in experimental physics, possibly the most important is his contribution to the theory of contact differences of potential. In mathematical physics his papers mainly deal with new methods of approach to older theory.

The remarkable thing about Anderson was his really wide knowledge of experimental and mathematical physics and his continuous keenness as a teacher, especially of advanced students. I remember hearing the late Prof. McClelland, his most distinguished student, state many years ago that it was usual for his advanced lectures on mathematical physics to go on continuously for three hours, and this was his practice almost up to his retirement. He simply revelled in physical and mathematical problems. Personally Dr. Anderson was a most kindly man with a marked sense of humour. M. P.

Prof. Antoine Meillet

WE regret to record the death of M. Antoine Meillet, professor of philology at the Collège de France, and president of the Historical and Philological Faculties at the École des Hautes Études, Paris, which took place at Châteaumeillant (Cher) on September 22, at the age of seventy years. Prof. Meillet was born at Moulins (Allier) on November 11, 1866. He became a lecturer in the École des Hautes Études in 1891. From 1904 until 1906 he was a professor of the École des Langues Orientales Vivantes and in the latter year was appointed to the chair of comparative philology in the École de France. M. Meillet was regarded as one of the most eminent philologists of the day, his researches extending over the whole field of the Indo-European and Iranian languages. His "Introduction à l'Étude Comparative des Langues Européennes", first published in 1897, has been through many editions, the last appearing in 1934.

WE regret to announce the following deaths:

Prof. Henry Le Chatelier, For. Mem. R.S., and honorary fellow of the Chemical Society, on September 17, aged eighty-five years.

Brig.-General Sir Brodie Haldane Henderson, K.C.M.G., C.B., president in 1928-29 of the Institution of Civil Engineers, who designed the Lower Zambezi Bridge, on September 28, aged sixty-seven years.

Lieut.-Colonel R. Knowles, C.I.E., acting director of the Calcutta School of Tropical Medicine, known for his work on medical protozoology, on August 3, aged fifty-two years.

Dr. A. H. Mackenzie, C.S.I., C.I.E., pro-Vice-Chancellor of the Osmania University, Hyderabad, who was a member of the recent Quinquennial Reviewing Committee of the Indian Institute of Science, Bangalore, on September 26, aged fifty-six years.