the export from British ports of the more obvious fatty materials used as food, but the fact that oils contain glycerine seems to have been largely overlooked, though the belated announcement made last July by Sir F. E. Smith, then Solicitor-General, that "it had recently (!) been discovered that glycerine could be made from lard" must not be forgotten. Some oils or oil-yielding materials are still being allowed to go to neutral countries; for example, linseed or linseed oil, and palm kernels, have been exported to Holland; whale oil is being largely shipped to Norway. Linseed oil, which was formerly only of use as a drying oil, can now be saturated with hydrogen and converted into a hard, white fat suitable for use in margarine. The same applies to whale oil; and there is a very large factory in Norway engaged in this work.

It was claimed in the debate that it is necessary to send these oils to Holland in order that cheap margarine may be returned to Britain. If this be so, the question arises whether all that is possible has been done to protect and foster our own margarine industry, and if the English output of margarine is at its maximum. The answer is probably in the negative—the English maker is short of labour and he is being undersold by his foreign rivals, who are making huge profits in the German markets.

PROF. C. R. ZEILLER.

CHARLES RENÉ ZEILLER, whose death after a long illness was announced from Paris a few days ago, was a member of the Institute, chief engineer of mines, and professor of palæobotany in the National School of Mines. Despite the heavy claims of official duties, Zeiller devoted himself to palæobotanical investigation for nearly forty years. His earlier papers dealt with the Carboniferous and Permian plants of France, and the most important of these is the volume, published in 1878, on the plants of the French Coal Measures. The beautifully illustrated and scholarly monographs of Palæozoic floras, including those of Valenciennes, Commentry (in collaboration with the late M. Renault), Autun, Brive, Creusot, and Blanzy, are models of scientific exposition and thorough workmanship. The two volumes on the Rhætic flora of Tonkin, published in 1903, are the most important of his contributions to the botany of the earlier phase of the Mesozoic era. He also wrote several papers on later Mesozoic plants from different parts of the world, and added considerably to our knowledge of the Permo-Carboniferous floras of South Africa, Brazil, and India, both by his description of new types and his masterly treatment of the wider problems presented by the so-called Glossopteris flora of the southern hemisphere.

Though mainly concerned with impressions of Palæozoic and Mesozoic plants, Zeiller's researches into the structure of the Palæozoic fern Psaronius and, more recently, his work on the anatomy of Lepidostrobus bear witness to his skill as a morphologist. For many years he contributed to the *Revue Générale de Botanique* a critical and comprehensive survey of recent palæobotanical literature; the enormous amount of work represented by these articles illustrates his untiring energy and his unselfish devotion to the subject which he loved. In 1905 Zeiller was elected a foreign member of the Linnean Society, and in 1909 he received the same recognition from the Geological Society of London. In the latter year he visited England for the first time to attend the Darwin celebration at Cambridge, and was one of the distinguished band of foreigners upon whom the University conferred honorary degrees.

Zeiller had a remarkably wide and accurate knowledge of his subject. He was much more than a learned systematist; while scrupulously accurate in his exceptionally lucid descriptions, he always took a broad view. He had the power of synthesis as well as that of analysis. He never wrote too much, and all that he did bore testimony to his courtesy, singleness of purpose, and modesty. Zeiller was a man of simple dignity and great personal charm; his death is a severe blow to a department of knowledge which claims a comparatively small number of students. He leaves a rich legacy of scientific achievement to a younger generation, and to his friends the stimulating memory of a noble character.

A. C. SEWARD.

PROF. F. R. BARRELL.

BY the sudden death, on December 2, of Prof. F. R. Barrell, at fifty-five years of age, the University of Bristol has lost one of the senior members of its staff. After graduating at Cambridge (Math. Trip., 1882, 14th wrangler; Nat. Sci. Trip., 1883) and in London University (B.Sc., 1884), he was for two years lecturer in Hammond Electrical College and for five years instructor in natural science in the *Britannia*. In 1890 he was appointed lecturer in mathematics in University College, Bristol, and was given the status of professor in 1893. When the University College was merged in the University of Bristol he was elected Dean of the Faculty of Science, and was one of the representatives of Senate on Council. At the time of his death he was Dean of the Arts Board, and again a member of Council.

Sound, especially in fundamental conceptions, rather than brilliant as a mathematician, his main interests lay in the application of mathematics to practical problems in physics and in methods of teaching, with constant insistence on the importance of a securer basis clearly and adequately grasped. His work bore fruit in its influence on those whom he trained. In his earlier days he wrote on electrical problems ("Electricity and Magnetism," 1894), and later on "Elementary Geometry" (1904). He was a pioneer in the localisation of a needle or bullet by

taking two photographs by X-rays on the same plate. Its position, including its depth, was worked out from the photograph by an elegant geometrical construction. He reduced the method to sufficient simplicity for its general use by surgeons, and it has proved of great value when the bullet is deeply and awkwardly placed. He used this method at Netley, where he served as expert adviser during his last long vacation. His offer to resume his work there during the coming Christmas vacation was accepted in a letter which reached his house shortly after his death.

His sincerity and loyalty, his ever-ready sympathy, and his faithful discharge of the many duties he gladly undertook, endeared him to his colleagues and to many generations of students, who were quick to recognise and to appreciate his worth. A man of strong convictions, and one who had the courage fearlessly to uphold them, he won the admiration even of those who differed from him. Within the University, and far beyond its precincts, he was rich in the friendship which attaches to characters such as his. He leaves a widow, who has shared with him the affection and esteem in which he was held, and two sons, who now hold commissions in the Army.

NOTES.

BY the death of Mr. Henry Eeles Dresser, from heart failure, at Cannes, on November 28, at the age of seventy-seven, ornithology has lost one of its most distinguished students. Attracted to the study of birds from his early boyhood, Mr. Dresser devoted the leisure hours which he could spare from the arduous duties of a city life to the elucidation of the avifauna of the Palæarctic region, and gave up his well-earned holidays to extensive travel in Europe, Asia, and America in prosecution of his favourite study. He made his first contribution to scientific literature in the pages of the *Ibis* in 1865, and for a period of almost fifty years he continued to write on ornithological subjects in that journal and in the Proceedings of the Zoological Society. His most noteworthy contributions to ornithology are, however, his "History of the Birds of Europe," in eight quarto volumes, 1871–81, followed by a supplementary volume in 1895–96; "A Monograph of the Meropidæ," 1884–86; "A Monograph of the Coraciidæ," 1893; "A Manual of Palæarctic Birds," 1902–3; and "The Eggs of the Birds of Europe," in two volumes, 1910. For the purposes of these monographs he gradually acquired a magnificent collection of the skins and eggs of Palæarctic birds, now in the Manchester Museum, each specimen in which is fully authenticated and adequately labelled. The care with which he attended to these matters has rendered his collection one of the most valuable in the country. His work is marked by thoroughness, rigid accuracy of description, and careful attention to detail, while the coloured plates, made mainly from drawings executed by Joseph Wolf and J. C. Keulemans, illustrating his monographs are among the most beautiful and accurate in ornithological literature. Ornithology is indeed the poorer by his death.

WE regret to announce that Dr. Robert Caird, of Messrs. Caird and Co., shipbuilders, Greenock, died suddenly of heart failure on December 1, in his sixty-fourth year. We are indebted to Prof. A. Gray for the following appreciation of his activities in scientific fields:—Dr. Caird was well known as an engineer and naval architect, and for many years had been recognised as one of the leading authorities on marine engineering and the construction of ships. After some time spent in America, at the works of the Pullman Car Company, he joined in 1888 the firm founded by his father (who in his day was a leading Clyde shipbuilder), and, with his brothers, Patrick and Arthur Caird, built nearly all the present vessels of the Peninsular and Oriental Company's fleet, and many other great liners. From 1899 to 1901 Dr. Caird was president of the Institution of Engineers and Shipbuilders in Scotland, and he was also a fellow of the Royal Society of Edinburgh. In 1900 the University of Glasgow conferred on him the honorary degree of doctor of laws for his services to applied science. But it is perhaps not so widely known that Dr. Caird was keenly interested in pure science, especially applied dynamics, and did much in many ways to promote its progress. About thirteen years ago he entered *con amore* into the movement for the better equipment of the University of Glasgow; his firm gave a large subscription to the fund, and Dr. Caird himself took a very special interest in the foundation and equipment of the splendid new Natural Philosophy Institute, which was one of the results of the movement. To every detail of that building he gave the most careful attention, and the Natural Philosophy Department owes much to his practical interest and generosity. He had previously been an active member of the committee of Clyde engineers, to whom the University is indebted for the erection and equipment of the James Watt Engineering Laboratories.

MR. C. J. WOLLASTON, who died recently at ninety-five years of age, was not personally well known among the younger generation of present-day telegraph engineers, for he retired from active work fifteen years ago with a well-merited recognition of his services in the introduction of submarine telegraphy. His name, however, will go down to posterity as that of a member of the small company to which was transferred the concession granted by Louis Napoleon for laying a telegraph line under the English Channel. He was one of the engineers in charge of the operations on the *Goliath*, which started on August 28, 1850, from Dover to lay the line thence to Cape Grisnez, and reached its destination in the evening, from which point messages were exchanged between England and France "under the strait and through it for the first time." The line consisted of a single gutta-percha covered wire 1/10 in. diameter coiled on a drum mounted amidships on the vessel, and weighing five tons. It was paid over a roller at the stern, and sunk to the bottom of the sea by means of leaden clamps. Within three days from being laid the line was destroyed, but the possibility of submarine telegraphy