and ground-nut oil. The diet is deficient in protein, salts, especially calcium and iron, and vitamins. Biochemical investigations showed that the blood sugar was above and the serum calcium below the generally accepted standards: the urea and chloride output in the urine were low, indicating a subnormal consumption of protein and chlorine. The protein intake was of the order of 85 gm. per diem, whereas with such biologically poor proteins as those from guinea corn and millet, at least 110-120 gm. should be considered the minimum necessary. It may be pointed out that the total amount of protein consumed by the Hausa is about the same as that taken by the population of St. Andrews; but the latter obtain their supply from both animal and vegetable sources, whereas the former utilise mainly cereal proteins of poor biological value. McCulloch makes several recommendations for improving the diet of the Hausa: more milk should be drunk and the breed of cattle improved by supplementing the deficiencies in their diet; the protein of the ground-nut should be eaten and not discarded as at present, 15-25 per cent ground-nut flour, containing not more than 5 per cent oil, being added to the ordinary flours used; the salt consumed should contain small amounts of iodine, and the consumption of green leaves should be increased. By these means, the protein, salt, and vitamin deficiencies could be overcome and the nutrition and resistance to disease of the population markedly improved, without any great interference with their present dietary habits.

[1] Medical Research Council. Special Report Series, No. 151: A Study in Nutrition; an inquiry into the diet of 154 families of St. Andrews. By E. P. Cathcart and A. M. T. Murray, assisted by Miss M. Shanks. (London: H.M. Stationery Office, 1931.) 1s. net.
[2] "An inquiry into the dietaries of the Hausas and Town Fulani of Northern Nigeria, with some observations of the effects on the national health, with recommendations arising therefrom." By Dr. W. E. McCulloch. *West African Medical Journal*, vol. 3; 1929–30.

James Clerk Maxwell, 1831–1879.

IN the history of science, names such as those of Galileo, Newton, Faraday, Darwin, Helmholtz, and Kelvin stand out like the peaks of a great range of mountains amid the surrounding lesser heights. One such name is that of Maxwell, the centenary of whose birth falls on June 13, and to whose memory homage will be paid at Cambridge in October by Profs. Einstein, Planck, Langevin, and others. Maxwell's work belongs to the third quarter of the nineteenth century, and fifty-eight years have now passed since the appearance of his "Treatise on Electricity and Magnetism", but the passing of time has shown much of his work to be of fundamental importance, and there is no investigator of physical subjects who does not owe something to him. He died at the age of forty-eight, when in the prime of life, a man loved and honoured by all who knew him, for the kindliness of his disposition and the charm of his character. Of his writings, it has been said that every one of them is stamped with the subtle and unmistakable impress of genius.

Maxwell was born in Edinburgh and was an only son. His mother died in 1839 and his father in 1856. The family name was originally Clerk, to which Maxwell had been added, thus becoming Clerk-Maxwell; but while this is the correct form, it is by the second of the names that Maxwell is generally known. Without the remarkable precocity of Young or Rowan Hamilton, Maxwell showed the possession of unusual powers at an early age, and as a schoolboy attending Edinburgh Academy he wrote a paper on oval curves. At the age of sixteen he entered the University of Edinburgh, being taught mathematics by Kelland, physics by J. D. Forbes, and logic by Sir William Hamilton. Three years later he left Edinburgh for Cambridge, where, after a term spent at Peterhouse, he entered Trinity College, having Hopkins as tutor. In 1854 he graduated as second wrangler and Smith's prize-man, Routh being senior wrangler and tying with him for the Smith's Prize. In October the following year, Maxwell was made a fellow of Trinity College, and in December published his first paper, on "Faraday's Lines of Force", a subject which was to engross much of his attention for the rest of his life.

From Cambridge, Maxwell went first to Marischal College, Aberdeen, and then to King's College, London, holding in both institutions the chair of natural philosophy. Four years were spent in Aberdeen and five in London, and to those years belong his memoirs on colours and colour-blindness, on the dynamical theory of gases, on the motion of Saturn's rings, and also his classic paper on a "Dynamical Theory of the Electromagnetic Field", read to the Royal Society on Dec. 8, 1864. It was this paper to which the attention of Hertz was called by Helmholtz, just when Hertz was on the threshold of his fruitful investigations of electro-magnetic waves.

From London, in 1865, Maxwell, who had suffered from serious illness, retired to his estate in Dumfriesshire—only, however, at the end of about five years to become the first professor of experimental physics at Cambridge. His inaugural lecture was delivered on Oct. 25, 1871, and on June 16, 1874, the now famous Cavendish Laboratory, erected by the seventh Duke of Devonshire, then Chancellor of the University, was opened. Maxwell's great "Treatise on Electricity and Magnetism", "one of the most splendid monuments ever raised by the genius of a single individual", was published in 1873; in 1878 he delivered the Rede Lecture, and just before his death, which occurred at Cambridge on Nov. 5, 1879, he had completed the editing of the electrical researches of his great forerunner, Henry Cavendish. "The Life of Maxwell", by Campbell and Garnett, appeared in 1882, his "Scientific Papers", edited by Niven, in 1890; and in 1896, Sir Richard Glazebrook published his book "Clerk-Maxwell and Modern Physics". To Sir Richard Glazebrook we also owe the account of Maxwell in the "Dictionary of National Biography".