were Tokat, Samsun, Ordu, Giresun, Sivas and Gumushare. In the block-faulting associated with this earthquake, four east–west lines were prominent: (1) the line of the upper Yeşil Irmak; (2) the line of the Kelkit–Deliçav; (3) the line of the Yavlas and middle Yeşil Irmak; (4) the line parallel to the Black Sea about 15 km. distant from the shore.

These lines were in part old orogenic lines, and were called into play again to relieve accumulating stress. Two distinct earthquake movements were observed during this shock. The first was horizontal and the latter, separated from the former by a short interval of time, had a distinct vertical component. With these, but particularly the latter, strong low-pitched rumbling sounds were associated.

OBITUARIES

Prof. H. L. Lebesgue, For.Mem.R.S.

HENRI LÉON LEBESGUE, professor in the Collège de France, a foreign member of the Royal Society and an honorary member of the London Mathematical Society, was born at Beauvais, Oise, on June 28, 1875; news of his death during 1941 recently reached Great Britain.

Lebesgue was one of the greatest mathematicians of recent times, but more of a specialist than most great mathematicians. His work has not the variety and versatility of Poincaré's or Hilbert's; he did not, as they did, enrich almost every branch of mathematics with his contributions. He was rather a man with one outstanding claim to fame. He had other things to his credit; for example, he made one important contribution (the *Pflastersatz* or 'pavement theorem') to topology; but that, and all his secondary work, of which there is not much, is overshadowed by his work on integration. There, he was first: the 'Lebesgue integral' is one of the supreme achievements of modern analysis.

It is no exaggeration to say that Lebesgue remade the integral calculus. The theory of functions of a real variable, of which the differential and integral calculus are parts, has been rewritten since 1900. The revolution had been initiated by Borel, whose famous monograph "Leçons sur la théorie des fonctions" was avowedly the starting point of Lebesgue's researches; but it was Lebesgue himself who took the decisive steps. The older theories of integration, in spite of all that Riemann, Darboux and others had done, were radically defective at several vital points, and in particular in their relations to differentiation. It was not true that differentiation and integration were 'usually' inverse operations, that integration and differentiation, or differentiation and integration, usually restored the original function. Indeed the whole theory was æsthetically unsatisfying; it tended to be cumbrous, long-winded and full of untidy exceptions; and the conservative mathematicians who detested it had a certain amount of excuse for their distaste.

All this is changed; the theory is now one of the most beautiful in mathematics. It unfolds itself in a series of terse and comprehensive theorems, with all the smoothness and elegance of the best 'classical' analysis. In particular, differentiation and integration dovetail harmoniously together. It is a readily intelligible, almost a 'popular' subject, and for this, by the unanimous testimony of every worker in these fields, it is to Lebesgue first that honour is due.

Lebesgue was a fine writer, with an admirably vigorous and lucid style. His two great memoirs, "Intégrale, longueur, aire" (1902) and "Sur les intégrales singulières" (1910), and his two books, "Leçons sur l'intégration" (1904 and 1928) and "Leçons sur les séries trigonométriques" (1906), rank among the classics of mathematical literature. It is sad that the second book should never have been re-edited, since the subject gives perhaps the finest illustration of the inevitability and vitality of Lebesgue's ideas. G. H. HARDY.

Dr. George Washington Carver

DR. GEORGE WASHINGTON CARVER, the distinguished Negro scientific worker who died at Tuskegee Institute, Alabama, on January 5, 1943, was born of slave parents at Diamond Grove, Missouri, in 1864. He was educated at Minneapolis High School and later at Simpson College, Indianola, Iowa. Graduating in science at Iowa State College in 1894, he proceeded to the M.Sc. two years later. In 1896 he was invited by the late Dr. Booker T. Washington to take charge of the Department of Agriculture at Tuskegee. He discovered on arrival that his duties, apart from administration and normal academic lectures, entailed the reshaping of the entire economy of the district. In fact, he had to conduct mobile classes in the field in order to persuade a despairing and ignorant community that its only salvation lay in adopting a new agrarian economy. The soil, he found, was arid, eroded, unproductive, and the system of farming outmoded. Every farmer in the region was cultivating cotton as a staple crop. Carver's open-air lessons included the cultivation of crops, soil conservation, fertilization, insect control, plant pathology, and the canning and drying of fruits and vegetables.

Carver recognized the necessity for introducing the peanut, *Arachis hypogaea*, and the sweet potato, *Solanum tuberosum dulce*, because soil and climatic conditions were favourable, and the crops were already being grown sporadically for local consumption by large sections of the community. He realized early that the replacement of cotton by peanuts and sweet potatoes was not a complete solution, and that newer and more extensive uses for them had to be found. A long series of chemical experiments culminated in the development of face powder, pigments, paints, stains and ceramic materials from Alabama clays; milk, buttermilk, cream, cheese, condiments, coffee, paper, plastics, stains, insulating boards and more than three hundred by-products from peanuts; starch, tapioca, syrup, coconut substitute, breakfast food, stains, artificial rubber, vinegar and paste from sweet potatoes; paving blocks, insulating boards, rugs, and cord ge from cotton. Peanut milk is now being extensively used in infant clinics in areas of tropical Africa where the tsetse fly is endemic.

Carver's scientific achievements have dwarfed his artistic work, but those who have seen his "Three Peaches" at the Luxembourg, or his "Yucca" at Tuskegee, are unanimous in their regret that he had not devoted more time to this department of life. As a man of science, he tenaciously refused to make profits from his inventions and discoveries, and never once took out a patent. It was characteristic of him to decline Thomas Edison's invitation to join his staff, preferring to work in obscurity among the simple folks he had come to know and love so much.