

layers, detached regions should be more often present than absent.

In the second chapter Mr. Fujiwhara compares his theoretical investigations with the results of sixty-five explosions during the years 1912 and 1913, for the most part those of the Asama-yama, in Central Japan. These show that the axis of the region of audibility may or may not agree with the direction of the wind at a moderate height; that in some cases the regions of audibility are triangular or spiral in form; that detached regions may occur on the same side of the source, while sometimes a very large detached region may be found in company with a very small one at the source; and, lastly, that detached regions of audibility and a silent region may appear in any direction and at any distance according to the prevailing condition of the weather. In Japan the monsoon exercises a powerful influence on the propagation of sound-waves in the atmosphere, and this accounts for the observed differences in summer and winter. In summer the formation of the detached region of audibility is rather common, and takes place towards the west or south-west of the source, while in winter the phenomenon occurs more rarely and is then caused by an approaching cyclone.

C. DAVISON.

SIR LAUDER BRUNTON, BT., F.R.S.

ON the 16th of the month this distinguished physician passed away after a long illness, borne with rare fortitude. Although retired from private practice, Brunton was far indeed from retirement in respect of those public causes to which, with the pious tenacity of his race, he devoted much of his life, and a fervour almost religious in its depth and constancy. Some weeks before his death the present writer had visited Lauder Brunton, and witnessed both the distress under which he laboured and the ingenious methods he had devised for keeping the evil at bay; not in the desire of a mere prolongation of life, though this indeed were no unworthy intention, but in order to cherish the fire of its last embers for those humane ends which he had so ardently at heart. It was therefore with admiration that, about three weeks before his decease, the writer received from his friend now silent a long and important letter covering certain documents and proposals on the subject of physical education, a movement to which, in his later years, Brunton had given no little energy and guidance, especially for the sake of children and young people, and which he was pressing forward almost with his latest breath. Fortunately, he has worked with comrades and assistants who will not fail to keep his lamp alight, nor let any of his last counsels be forgotten.

At St. Bartholomew's Brunton proved to be not only a distinguished man of science, but also of much accomplishment and success in the practice of his art. Like James Goodhart of Guy's, who died but a short while before him, he won the faith and attachment of a large *clientèle* by merit

pure of all self-seeking. Although these great teachers were not quite alike in the ways of their medical observation, yet to the particular skill of each were added kindness of heart and an earnest sympathy which won the confidence of the sufferers who sought their aid. If Brunton had not the imposing personal presence of certain eminent physicians of the past, no one could speak with him without being affected by his gentle, persuasive enthusiasm, and that faith in his art and in mankind which engendered alike faith and hope in those who only too often sorely needed these blessings.

Lauder Brunton was one of the first of the scientific practising physicians who used no empirical remedies without seeking to discover their mode of action, and by pharmacological and other research endeavoured to add to their number. Bence Jones, Golding Bird, Pavy, were of the generation before him, it is true; but few physicians whose interests before all else were, and still remained, clinical, had likewise followed scientific investigation so systematically and in so disinterested a spirit. Moreover, in his particular departments of science Brunton was a pioneer, especially in pharmacology and in the physics of the circulation. With a mind strengthened by the seriousness and philosophical temper of his great university of Edinburgh, Brunton, after graduation, spent two or three years in foreign study, for the most part in Germany; and no British physician had a better knowledge than he of German teachers, German industry, and of that necessary condition—the German tongue. Thus for him the war was full of sadness.

In this brief tribute no attempt can be made even to indicate the character and extent of Brunton's scientific work, pharmacological, clinical, and hygienic. His contributions are only partially presented, indeed, in the two or three portly octavos in which many of them were recently reprinted. But if to the chief or to the more familiar of his works some allusion may be made, it would be to his researches with Fayrer into venoms—a successful attempt to clarify a very ancient and chequered story, as the historian of medicine well knows; to his part as one of the Commission which reported on Pasteur's treatment of hydrophobia; to his services on the Hyderabad Commission on the effects of chloroform, by which, if its results were doubted in some quarters and in others enlarged, nevertheless the whole problem was raised to the plane of its infinite importance; to his work on tuberculosis, which was informed by the spirit of a social prophet; and to his researches on the dynamics of the circulation. Herein he made the beneficent discovery of the nitrites as palliative, or better than palliative, in that awful malady angina pectoris, a discovery deserving to rank with that of Peruvian bark in the cure of ague. If, as the present writer has remarked elsewhere,¹ the discovery arose accidentally from

¹ "Diseases of the Arteries," 1915.

the use of a graphic curve which betrayed the inadequacy of the sphygmograph to follow the finer movements of the artery, yet how many brilliant discoveries have arisen from accidents of manipulation or interpretation! To have discovered the means of controlling one of the most cruel ills to which man is subject is perhaps the laurel wreath amid the many memorials of one who, in his humanity, would have prized this above all rewards.

By academic and official decorations Lauder Brunton was richly distinguished; but perhaps, in his loyal and patriotic heart, the honour of none of these was to be compared with the glory of his younger son, a promising Cambridge medical graduate, who last year gave his life on the field of battle for his country—a glory, but also a sorrow which, falling but a brief five years after Lady Brunton's death, deepened the shadows of his latter days. Happily his elder son, also on military service, and his devoted daughters were still spared to him. C. A.

The death of Sir Lauder Brunton on September 16, in his seventy-third year, has deprived the world of a great physician, and brought sorrow to a wide circle of friends. Largely by his vivifying studies and teaching, pharmacology has become a definite branch of science. Practical medicine depends on physiology, pharmacology, and pathology, and all three tend more and more to become subdivisions of the all-embracing science of chemistry. In no departments of the healing art is the influence of laboratory methods more apparent than in those directed to the study of disorders of digestion and diseases of the circulation; and in both these directions Sir Lauder Brunton was a pioneer worker. He had the clearest conceptions of clinical facts, and possessed to an unusual degree the practical quality of being able to apply extensive knowledge of physiological medicine to the work of the hour. His stimulating personality will be widely missed by his professional brethren as well as by many who have benefited by his work and advice.

Thomas Lauder Brunton was born at Hiltons Hill, Roxburgh, in 1844, and received his medical training at the University of Edinburgh, where he had a distinguished academic career, and graduated M.B., C.M. with honours in 1866, receiving also the gold medal for his thesis. In the following year he became B.Sc., in 1868 he obtained the M.D., and two years later the D.Sc., in the meanwhile having also studied at Paris, Vienna, Berlin, and Leipzig. Settling in London, he became lecturer on *materia medica* at the Middlesex Hospital in 1870 and assistant physician at St. Bartholomew's Hospital in 1875, to which school he remained attached as lecturer, physician, and consulting physician.

Early in his career Brunton's inclinations leaned towards the scientific side of medicine, and at the early age of thirty he was elected F.R.S. in recognition of his admirable work on the physiology of digestion and secretion, on the chemical

composition of the blood, and on the actions of the two drugs, digitalis and mercury.

Brunton's post at St. Bartholomew's carried with it the lectureship on *materia medica* and therapeutics, and he turned his attention to the effects of medicines and instituted many experimental investigations on the actions of drugs upon himself and upon animals. In 1885 he published his well-known book on "Pharmacology, *Materia Medica*, and Therapeutics," which passed through many editions in this country and abroad. This appeared at an opportune moment, and largely owing to his work and writings pharmacology became separated from *materia medica* and established as a branch of physiology.

In 1886 he was appointed a member of the Commission to report upon Pasteur's system of inoculation for hydrophobia, and in 1889 a member of the Nizam of Hyderabad's Chloroform Commission. For the latter a considerable amount of experimental work was carried out and a valuable report issued, though no very definite conclusions as to the action of chloroform were arrived at. In the meantime, Brunton had become one of the best-known consulting physicians in the country, and in the art of treatment he was most resourceful. He introduced a new class of remedies, the vaso-dilators, into medicine, and by the use of amyl nitrite for angina pectoris was the first to employ a remedy because its physiological action was opposed to the pathological condition existing in this disease, viz. rise of blood-pressure.

In 1900 he was knighted, and nine years later was given a baronetcy, and he was the recipient of many honours from universities and societies at home and abroad. He was also Gulstonian and Croonian lecturer and Harveian orator of the Royal College of Physicians of London. Several works emanated from his pen, notably the "Introduction to Modern Therapeutics," illustrating the connection between the chemical structure and physiological action of drugs, "Disorders of Assimilation," and "Therapeutics of the Circulation."

Sir Lauder Brunton, outside his professional work, was keenly interested in all schemes in favour of national health, of school hygiene, of physical culture and military training, in the furtherance of which he gave bountifully of his time and energies.

NOTES.

GEOLOGISTS will regret to hear of the death of Mr. R. J. L. Guppy at his home in the island of Trinidad on August 5, and within a few days of celebrating his eightieth birthday, Mr. Guppy having been born in London on August 15, 1836. In early life he qualified as a civil engineer, and afterwards travelled through Australia, Tasmania, and New Zealand. On joining his family in Trinidad in 1859, he took part in the construction of the Cipero Railway, but later becoming interested in the educational work of the colony, he was appointed Chief Inspector of Schools. Mr. Guppy, however, will be better re-