

railway authorities state, for example²², "The conditions on the Railway are tropical and there is very little corrosion. Steel trough sleepers removed from the main line after 35 years service still retain a great deal of the original mill-scale" and "Iron covered goods wagons built in 1883 are still free from corrosion" but "Plates which give over thirty years of life in this part of India do not last more than a few years in Burma or on the Bombay Coast".

Thus, the most probable explanation of the preservation of the Delhi pillar seems to be the combination of 'purity' of atmosphere and the climate. The other specimens of Indian iron have not all had the same favourable conditions although the metal is similar and so a good deal of rust is found on some of them. The specimens of ancient iron found in countries other than India may be said in general to be in a state of preservation varying with their climatic environment. Thus many specimens, preserved excellently, have been excavated in Egypt²³; here conditions have been dry, stretches of the desert are alkaline, and the atmosphere is unpolluted, though it has also been suggested²⁴ that the iron is of meteoric origin and owes something of its preservation to a high nickel content. On the other hand, specimens of Roman iron found in Britain are found to be extremely

rusty, although Friend and Thornycroft²⁵ comparing the still metallic part of a corroded nail with a modern mild steel found that the ancient iron was the more resistant to corrosion of the two.

On the whole, it must be concluded that, although we should regard the operative skill and capacity for hard work of the ancient smiths with admiration, we cannot really expect to solve our corrosion problems by contemplation of their products.

²² Presidential Address to the Staffs. Iron and Steel Inst., Sept. 30, 1911.

²³ "Medieval Sinhalese Art".

²⁴ *J. Iron and Steel Inst.*, No. 1, 129; 1912.

²⁵ *J.I.S.I.*, No. 1, 152; 1912.

²⁶ Pliny, Book XXXIV. Chap. 43.

²⁷ *J.I.S.I.*, No. 1, 179; 1912.

²⁸ *J.I.S.I.*, No. 1, 84; 1908.

²⁹ *Trans. Far. Soc.*, 11, 236; 1916.

³⁰ *J. West of Scotland I.S.I.*, 1913-14.

³¹ *J.I.S.I.*, 122, 237; 1925.

³² "Iron in Antiquity", p. 147.

³³ *Proc. Roy. Soc.*, 1934.

³⁴ Report of Com. A 5, *Proc. Am. Soc. Test. Mat.*, 27, Part 1; 1928.

³⁵ *J. Soc. Chem. Ind.*, 49, 173, T; 1930.

³⁶ *Trans. Electrochem. Soc.*, 64, 48; 1933.

³⁷ *T.F.S.*, 23, 164; 1927.

³⁸ "Corrosion Committee of Iron and Steel Inst. First Report (1931)", p. 18.

³⁹ Hadfield, *T.F.S.*, 11, 183; 1916.

⁴⁰ T. A. Rickards, *J.I.S.I.*, No. II, 333; 1929.

⁴¹ *J.I.S.I.*, 11, 225; 1925.

Obituary

M. B. BAILLAUD

BENJAMIN BAILLAUD was born in 1848, a year of revolutions, and his peaceful life, which came to an end on July 8 last, was crossed by two wars which shook France to her foundations. Passing through the École Normale, he became an assistant to Leverrier at the Observatory of Paris, and also his substitute at the Sorbonne. After the defeat of France in 1870, Baillaud, then at the meridian of his energy and clearness, shared in the immense revival of France which had its place in the sciences, as well as in other directions. Sent to Toulouse, to reform the Observatory in succession to Tisserand, and afterwards as dean of the Faculty of Sciences, he performed these duties with singular zeal and effectiveness. He modernised the Observatory and brought many men, since famous, to the University; in the former respect we may mention only, as an instance of his foresight, that he developed as a pioneer, celestial photography. He also established at the greatest height then known, more than 9,500 ft., an observatory, chiefly, of course, meteorological, on the Pic du Midi de Bigorre, in the Pyrenees.

Chosen director of the Observatory of Paris in 1907, and so titular head of French astronomers, Baillaud added to his previous work on celestial photography an interest especially in time determination and distribution, a matter in which his friendship with Ferrié, then in charge of the station

at the Eiffel Tower, assisted. The Observatory of Paris has a long and notable history, and is housed in Paris in a celebrated building, which is scheduled among the historic monuments of France. It was in Baillaud's time, however, somewhat out of date in equipment. He had, fully formed, complete plans for the renovation of the observatory, but circumstances prevented a repetition of his work in re-equipment, as at Toulouse, as it also prevented his repeatedly expressed desire for retirement.

The latter was not the desire of the astronomers however. When the sixth Congress met in 1909 to regulate celestial photography and produce the astrographic catalogue and the Carte du Ciel, Baillaud was chosen president. Later, with Ferrié, two successive congresses were summoned at the instance of the Bureau des Longitudes, in 1912 and 1913, to deal with time distribution, which was initiated, so far as Europe was concerned, and has since been maintained, from the Eiffel Tower, and afterwards from other more powerful stations; the first of these congresses chose Baillaud as its president, and he kept the organisation in being right through the War, though none of the countries which had initialled the document creating the Bureau de l'Heure ratified it. He only resigned this charge, as he resigned that of the Carte du Ciel—without ceasing an interest in them—in 1919, when he was chosen as the first president of the International Astronomical Union;

which with his invariable sense of duty he demitted in 1922; but he did not cease to attend the meetings. He was present at Cambridge in 1925, when the University conferred an honorary degree upon him.

Baillaud's work was for the most part administrative and official, so there is comparatively little to signalise personally, and that is technical; but he was a good mathematician, and contributed many discussions upon the usual subjects. He retired in 1926, and lived until the present year in the south of France, chiefly about Toulouse, or the Pyrenees, to which he was much attached.

He was a man of many friends, and incapable of rancour. In his long retirement he became, as a relative writes, *toute bonté*. R. A. S.

WE regret to announce the following deaths:

Prof. B. J. Collingwood, O.B.E., professor of physiology in the University of London, on August 9.

Prof. G. Dreyer, C.B.E., F.R.S., professor of pathology in the University of Oxford, on August 17, aged sixty-one years.

Prof. W. M. Hicks, F.R.S., formerly professor of physics and also first Vice-Chancellor of the University of Sheffield, on August 17, aged eighty-three years.

Prof. W. McF. Orr, F.R.S., lately professor of pure and applied mathematics at University College, Dublin, on August 14.

News and Views

Sir Peter Chalmers Mitchell, C.B.E., F.R.S.

At the August general meeting of the Zoological Society of London, it was announced that Sir Peter Chalmers Mitchell would retire from the secretaryship at the annual meeting next April, and the Council would nominate Prof. Julian S. Huxley for election as his successor. For the past thirty years, Sir Peter has done so much towards making the Zoological Gardens more attractive to the public, while adding to the opportunities which they afford for scientific research, that his retirement marks the end of a brilliant epoch in the history of the Society. Only those who have been closely associated with him can realise the indebtedness of the Council to his ever-ready initiative and inspiration in the undertakings which they have entrusted to his tactful direction. One of his earliest tasks was the removal of the offices, library, and meeting room from Hanover Square to a new building in the Gardens, where there was more ample and convenient accommodation. A small extension to the Gardens was then arranged, in return for the provision of some paddocks open to public view in Regent's Park. The Mappin Terraces soon followed as a generous gift, and eventually the Society was induced to risk great expenditure in placing under the Terraces the Aquarium, which was so well planned and arranged that public appreciation returned the outlay almost at once. The new buildings for apes and monkeys, reptiles, and insects, besides rearrangements for the parrots and smaller birds, and the provision of an adequate sanatorium, should also be mentioned; nor must the new and comparatively luxurious refreshment houses be forgotten. Sir Peter Chalmers Mitchell, however, will always be best remembered by the great share he took in the acquisition, planning, and organising of the Zoological Society's country park at Whipsnade, where wild animals live under almost natural conditions, and can be studied in ways for which there is no provision in an ordinary menagerie.

THROUGHOUT his administration, Sir Peter Chalmers Mitchell has always encouraged the use

of the Society's collection for scientific research. His own work on the anatomy of vertebrates came nearly to an end with his great memoir on the intestinal tract in mammals in the Society's *Transactions* in 1905, but he continued to stimulate others in the prosectorium, and he organised new lines of investigation. He induced a succession of pathologists to join the staff, and they have now for many years published valuable results, besides helping to improve the health of the animals. Parasites have been systematically collected and studied; and for some time after its foundation the scientific problems of the Aquarium were examined by a special assistant. The scientific meetings of the Society have been arranged to make a wider appeal to the fellows, and most of the technical papers are now taken as read for publication in the *Proceedings*. Sir Peter, indeed, will hand on to his successor an admirable organisation for making the best use of the scientific resources of the Society. He retires with the best wishes of zoologists for the enjoyment of his well-earned leisure, which will enable him to return to the quiet contemplation of the subjects which he has made his own.

Centenary of Sprengel, 1834-1906

AMONG the many men of science of German birth who during last century made England their home was Herman Johann Philipp Sprengel, F.R.S., the centenary of whose birth occurs on August 29. Born at Schillerslage near Hanover, he studied physics and chemistry at Göttingen and Heidelberg, taking the degree of Ph.D. in 1858. In January 1859 he came to England and for three years was associated with Brodie at Oxford. He then settled in London and engaged in research work at the Royal College of Chemistry and in the laboratories at Guy's and St. Bartholomew's Hospitals. From 1865 until 1870 he was chemist at Farmer's chemical works in Kennington, after which he devoted himself mainly to his own inventions. He was elected F.R.S. in 1878 and in 1903 the title of professor was bestowed upon him by the German Emperor. He died suddenly on January 14, 1906. Sprengel will always be remembered for his invention in 1865 of the dynamic