

"A Storage-reservoir in the Achteveld," 29th October, 1879.—Transactions South African Philosophical Society, vol. i. p. 219.

"Some of the Problems awaiting Scientific Research in South Africa."—Transactions South African Philosophical Society, vol. ii. p. 91.

"Summer and Winter Temperature in South Africa," 30th March, 1881.—Transactions South African Philosophical Society, vol. ii. p. 104.

"Rainfall in South Africa."—Quarterly Journal of the Meteorological Society, vol. vii. 1881, p. 3.

"Note on a Comparison of Maximum and Minimum Temperature and Rainfall on Table Mountain and at the Royal Observatory, Cape Town, during January and February, 1881."—Quarterly Journal of the Meteorological Society, vol. vii. p. 249.

"Proposals of the Table Mountain Water Supply Company," 26th April, 1882.—Transactions South African Philosophical Society, vol. iii. p. 5.

"The Barometer and the Winds," Annual Address as President of the South African Philosophical Society, 26th July, 1882.—Transactions South African Philosophical Society, vol. iii. p. xix.

"The Waterworks of Port Elizabeth, South Africa."—Minutes of Proceedings Inst. C.E., vol. lxxiv. p. 128.

Annual Address as President of the South African Philosophical Society, 25th July, 1883.—Transactions South African Philosophical Society, vol. iii. p. xlvii.

"Meteorological Notes," 4th December, 1884.—Transactions South African Philosophical Society, vol. iv. p. 10.

"Catalogue of Printed Books and Papers relating to South Africa.—Part II., "Climate and Meteorology."—Cape Town, 1885.

"Altitudes above Sea-level of Places in South Africa South of 20° S. Latitude."—Cape Town, 1886.

"Water Supply in the Cape Colony."—Minutes of Proceedings Inst. C.E., vol. xc. p. 255.

"Rainfall on and around Table Mountain, Cape Town, Cape Colony."—Quarterly Journal of the Royal Meteorological Society, vol. xiv. 1888, p. 12.

The whole of these documents may be found in the Library of the Institution.

JOSEPH HINDLE, third son of the late Rev. Joseph Hindle, B.D., Vicar of Higham near Rochester, was born at Gravesend on the 5th of April, 1838, and was educated first at a preparatory school at Ramsgate and then at Oakham Grammar School under the Rev. W. S. Wood, D.D., the present vicar of Higham. In March, 1856, he was articled for three years to Messrs. George Rennie and Sons and in June, 1859, became a pupil of Mr. W. M. Brydone, then Chief Engineer of the Great Northern Railway, by whom he was subsequently employed on the Garston and Liverpool Railway.

In the autumn of 1861 Mr. Hindle obtained an appointment as an Engineer in the service of the Peruvian Government. For six years, during which time he passed from the Third to the First Class, he was chiefly occupied in making surveys, plans and estimates, and in preparing reports, and carried out little actual constructive work, with the exception of the conversion of the corvette "Loa" into an ironclad and her subsequent recovery after she had been run aground in the harbour of Callas. In 1866 he was granted permission to practise privately, his services, however, still being retained by the Government. In February of the same year he was appointed a Resident Engineer on the Lima Railways under the late Mr. Oswald Younghusband. In 1868 and 1869 he made preliminary surveys for the Pacasmayo Cajamarca Railway across the Andes, about 100 miles in length, and for the line from Chimbote to Huaraz and Recuay, cutting through the Cordillera Negra, a range about 16,000 feet high. The length of the latter survey was about 130 miles of most difficult country, the height of Recuay above the sea being over 11,000 feet. He also made the final survey of the first section (40 miles) of the Oroya Railway, on the construction of which he subsequently acted as District Engineer. In August, 1871, he was appointed Engineer-in-Chief of the Eten, Chiclayo and Ferrenafe Railway, a line of about 30 miles. The principal works were three bridges over rivers subject to heavy floods, and a screw-pile pier at Eten, 2,600 feet long, through a heavy surf. In December of the following year he was placed by the Government in charge, as Engineer and Manager, of the Ylo and Moquegua Railway, 67 miles in length. The line was sold to a private company in 1877, when Mr. Hindle retired from the Government service and left Peru for England in order that his children might be educated in this country.

From that time Mr. Hindle seems to have carried out very little professional work until October, 1890, when he was sent by Messrs. James Livesey and Son to Yucatan, Mexico, to examine and report upon the existing railways of that empire and also to make an investigation and to prepare estimates for the construction of additional lines, to gather statistics as to probable traffic, and, in fact, to obtain such information as would enable that firm to report as to the advisability of purchasing the lines already in existence and of executing new works. He returned in the following April, having fulfilled this mission in a most complete and satisfactory manner, and was then employed by Messrs. Grace Brothers & Co., contractors, on the Central Railway of Peru. III

health, however, compelled him to return to England in the autumn of 1891, and he died in London on the 18th of August, 1892, at the comparatively early age of fifty-four.

As an Engineer, Mr. Hindle was able and enthusiastic, and might always be depended upon to carry out thoroughly and satisfactorily whatever work was entrusted to him. As a man he was genial and kind-hearted, and deservedly popular among all who came into contact with him. He was elected a Member of the Institution on the 2nd of December, 1879.

ALEXANDER CARNEGIE KIRK, LL.D., who died suddenly at Glasgow on the 5th of October, 1892, was senior partner in the firm of Messrs. Robert Napier and Sons, the engineers and ship-builders of Govan. He was born on the 16th of July, 1830, at Barry, Forfarshire, of which parish his father was minister, and was educated at the Burgh School, Arbroath, and at the University of Edinburgh. He then went to Glasgow, where he served an apprenticeship of five years to the late Mr. Robert Napier at the Vulcan Foundry, Washington Street.

On the completion of his apprenticeship in 1854 he proceeded to London and eventually became Chief Draughtsman in the office of Messrs. Maudslay, Sons and Field, with whom he remained six years. He then accepted the post of Engineer and Manager of the paraffin oil works of Messrs. Young, Meldrum and Binney at Bathgate, for which firm he constructed the first practical atmospheric refrigerating-machine and subsequently designed and erected new works at West Calder, involving the sinking of shale pits and the construction of a branch line from the North British Railway. At both these works he displayed great genius for devising means of facilitating labour and economizing energy; numerous improvements in shale-breaking and cooling-machinery were introduced by him, one of his inventions being a freezing-machine for use in separating the solid paraffin in the oil. Hitherto this had been done by ether-machines, but ether being dangerous Dr. Kirk in 1862 commenced a series of experiments on air-machines, with the result that he designed and made the dry-air freezing-machine which is now in a modified form so extensively used in connection with the carriage and storage of meat from the colonies. In 1864, he read before the Institution of Engineers in Scotland a Paper¹ on this subject and nine years later

¹ Trans. Inst. Engs. Scotland, vol. viii. p. 14.