

to be superintendent general of education at the Cape. He reached South Africa in May 1892, and with the enthusiasm of a pioneer pulled together a loose educational system into a systematic whole. He served with conspicuous success until he retired in 1915, having left behind him a broad and liberal spirit in the Cape educational system.

Muir initiated three educational reforms. First he abolished the elementary examination in the schools and improved the curriculum by the addition of domestic economy, woodwork and drawing. Secondly, he encouraged the teaching of science, which at first he found to be almost non-existent. Thirdly, he made substantial improvement in the conditions for the training of teachers. He paid careful attention to the erection of properly equipped training institutions and schools. As a friend has lately remarked, "To whatever little village you go, you will find there no better building than the school."

With unstinted singleness of purpose Muir devoted his leisure, during and after official duties, to mathematics: and his writings upon determinants have already become classical. His first book, the "Treatise on the Theory of Determinants" (Macmillan), appeared in 1882, and a second in 1890. These were followed by the well-known four-volume "History of Determinants" (vol. 1, 1906; 2, 1911; 3, 1920; 4, 1923) together with a supplementary fifth volume (Blackie, 1929). The "History" has recorded with almost complete success the name, place and contents of every published book, thesis and note upon determinants from the earliest records up to date 1920. A sixth volume running to the year 1940 was actually in preparation. In the hands of most compilers such a work could be valuable perhaps but certainly dull. Muir, who had considerable literary and poetic gifts, made it positively gay! Forty-nine years separate the date of the first list

of writings on determinants from the publication of vol. 5.

Altogether Muir wrote 307 mathematical papers. He rendered notable service by making accessible to all mathematicians the pioneering work in algebra of Laplace, Bezout, Cauchy, Schweins, Jacobi, Reiss, Bazin, Sylvester and Cayley. By his artistic sense of form, his use of a telling notation and of judicious commentary, Muir moulded countless isolated and overlapping propositions into a convincing whole. He showed his greatness not in intuitive discoveries but in his eminent reasonableness. He reaches through his books a wide mathematical public, and has taken an essential part in the algebraic discoveries associated more particularly with Edinburgh, where so much of his work has been published.

Muir was a fellow of the Royal Society of Edinburgh, later receiving the Keith Prize (1884, 1899) and the Gunning-Victoria Prize (1916). He was an early president of the Edinburgh Mathematical Society, and an honorary graduate of Glasgow (1882) and of the University of the Cape of Good Hope (1901), where he was Vice-Chancellor. In 1892 he became a fellow of the Royal Geographical Society, and in 1900 he was elected a fellow of the Royal Society. He was made C.M.G. in 1901 and knighted in 1915.

Muir had wonderful health. From sixty to eighty-four years of age he played tennis, and later took exercise by sawing wood. He had a gentle kindly manner, a quick smile and a keen sense of humour. He loved flowers, was a scholarly musician, and had a fine literary sense. To the end he preserved an unclouded brain and an acute and investigating spirit. By a deed of gift, Muir has bequeathed his wonderful library of mathematical books and serials to the Public Library of South Africa.

In 1876, he married Margaret Bell, of Dumbartonshire, who predeceased him by many years. He is survived by three generations. H. W. T.

News and Views

America and Trade Prospects

DISCUSSING the effect of American recovery on trade prospects at a luncheon arranged by the Aberdeen Chamber of Commerce on September 10 during the recent meeting of the British Association, Sir Josiah Stamp stated that the influence of a larger volume of American prosperity upon British trade would be chiefly through the stimulus of rising gold prices and lower value of gold, a revival of foreign trade, payment of debt through easier imports and a readiness to organise for an international standard of value. America could take the lead in reversing every one of the chief heresies at present throttling the world's prosperity. Unfortunately, a new phase of weakness has shown itself recently in American business activity, though in Great Britain a slight but distinct improvement has taken place since June last. In America, all the elements of which confidence can take advantage are now provided, though many

new features have been introduced which confidence has to surmount, and confidence is slow in coming. The complex situation in America may be classed under three heads, (1) salvage and desperate relief efforts after the disasters of 1933, (2) steady application of recognised or new remedies for recovery and (3) long run provision for a new industrial order. The first stage is now becoming less important, and therefore the measures taken under the three heads, hitherto contrary and mutually antagonistic, ought less and less to be so and more and more to emerge with the second dominant. It is impossible, however, to press on the provisions for a new order, before trade under any order at all is strong enough to stand it. Meanwhile, our own trade revival is testing the limits of domestic trade, and if a general increase in export trades does not reinforce it, further extension can only be obtained with increasing difficulty.