without attrition in the highest circles, need undergo such a tax on the memory as the stranger who would desire neither to offend nor to shock a Mu-ila man or woman. The language is full of pitfalls, because it is as rich in double meanings as any European tongue. You may be grossly indecent in alluding to common objects of the house or garden implements.

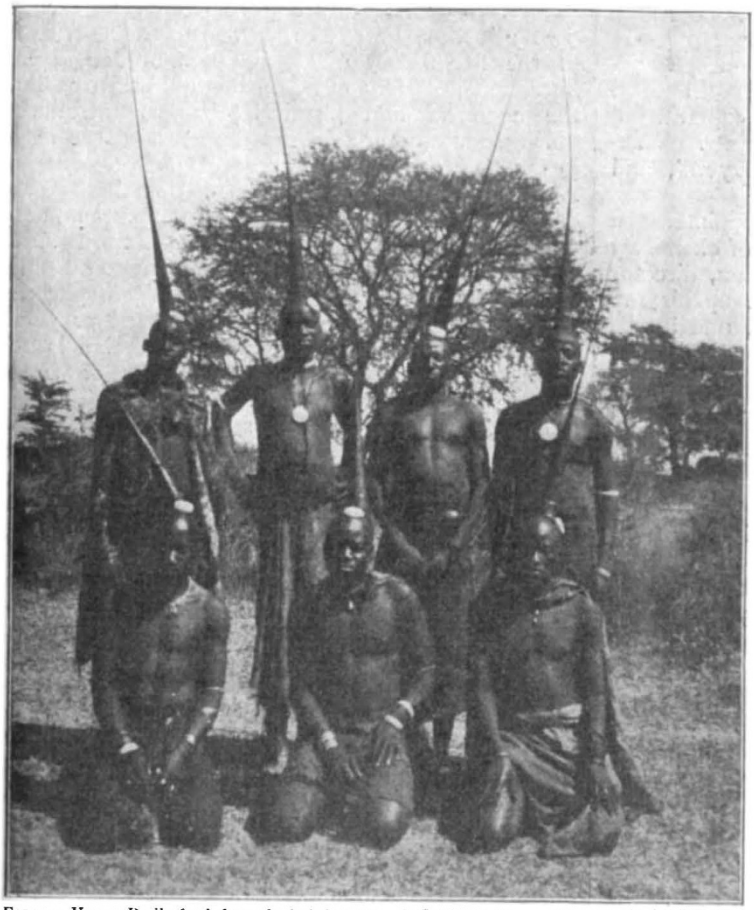

FIG. 2.—Young Ba-ila fresh from the hairdresser. From "The Ila-speaking Peoples of Northern Rhodesia."

The Ba-ila are so sensual that the relations between the sexes are nearly promiscuous. Yet here again everything must be governed by custom. One man may be fined lightly for a gross act of immorality, while another will be mulcted severely for merely alluding to an indecent proposition. Many of the dances and a number of the songs—especially those sung at funeral ceremonies—are termed by the authors "phallic," and here very sensibly they quote the actual words and deeds, lest imagination should exaggerate. The authors conclude that this condition of immorality, especially among quite young people—children not fully mature—is leading to a seriously diminishing birth-rate.

In some writings on Africa missionary work is still sneered at; but one result—especially in South and East Africa—has been to raise the birth-rate amongst the negroes by discouraging polygamy, and, above all, by strenuously urging the abolition of the depraving initiation ceremonies and all immodest behaviour amongst young girls and boys. The worst feature in Ila-land is the abuse of quite young girl-children by adult men.

But the study of these primitive people as a whole leaves one with a very pleasant mental impression, alike of them and of their two interpreters, Mr. Smith and Capt. Dale. The absolute truth is told about them, but it is told so tersely, with so much humour, sympathy, and insight, that the discriminating reader, the ethnologist above all, rises from the reading of "The Ila-speaking Peoples" with a sense of gratitude to the authors and with a wonderfully vivid impression of negro life in South Central Africa—a life in that particular region very little influenced as yet by the white man. One hopes sincerely that the Ila people may turn the corner under wise administration and missionary teaching, and become in time a flourishing race, playing a considerable part in the development of Northern Zambezia.

Industrial Research Associations.

III.—The British Cotton Industry Research Association.

By Dr. A. W. Crossley, C.M.G., F.R.S.

THIS association was incorporated in June, 1919, but much valuable work had been done previously by a Provisional Committee appointed by the Department of Scientific and Industrial Research towards the end of 1916. The Committee was presided over by Mr. J. W. McConnel, to whose efforts it is largely due that more than 90 per cent. of all the spinners, doublers, manufacturers, bleachers, dyers, calico printers, and finishers engaged in the cotton industry have given their support to the association, which now numbers 1461 members, including representatives of the lacemaking and hosiery trade. The first chairman of the association was

Mr. H. R. Armitage, of the Bradford Dyers' Association, who was most unfortunately compelled to resign owing to ill-health after a few months' activity. His place has been taken by Mr. Kenneth Lee, of the Tootal Broadhurst, Lee Co., Ltd. The council of the association is composed of men representing all sections of the industry, and is strengthened by the inclusion of some men of science and leaders of the following great operatives' organisations: the Amalgamated Association of Operative Cotton Spinners, the Card and Blowing Room and Ring Frame Operatives' Association, the Amalgamated Weavers' Association, and the Operative Bleachers', Dyers', and Finishers' Association.

In November, 1919, the council appointed the present writer, then Daniell professor of chemistry in King's College, University of London, director of research. He was unable to take up his full duties until April of the present year, and in the meantime plans for the future development of the association's activities were discussed. It was decided that individual scientific effort would not give the desired results, which could only be obtained by establishing an institute worthy of the great cotton industry, where all the sciences involved in that industry would be found represented and working in the closest co-operation. Apart, therefore, from the annual income of the association, the council has decided to raise a special building fund of 250,000*l*. A property with more than 13 acres of ground has been purchased in Didsbury, and the existing house adapted to serve as the administrative block, with accommodation for offices, library, council room, etc., as well as dining rooms, rest rooms, and some living rooms for the research workers. Owing to the housing difficulty, it has also been decided to build a certain number of houses in the grounds, where the first portion of the laboratories and workshops is also in course of construction. The whole will be known as the Shirley Institute.

The heads of the following departments have been appointed: Information and records bureau; botany; colloid chemistry and physics; general chemistry; organic chemistry; and physics; and, pending the completion of the new laboratories, accommodation has been placed at their disposal by the Manchester University and the College of Technology. The information and records bureau will have for its main object the acquiring of all information regarding cotton, which will be available for the members of the association. In addition, current literature will be abstracted and indexed, and reports on previous work on cotton will be prepared. This naturally means the gradual acquisition of an extensive library, and it is hoped that, in accordance with the suggestion contained in the Report on Libraries and Museums of the Adult Education Committee of the Ministry of Reconstruction (Cmd. 9237), this will become a central library organisation for the cotton industry.

The council has taken a very broad view regarding the nature of the research work to be undertaken, which is necessitated by the almost complete interdependence of the various sections of the industry. Work which will benefit one section must of necessity exert an influence on the whole industry. Hence, as shown by a programme of research drawn up by the research committee for the general guidance of the director and research staff, the work will be mainly of a fundamental nature. For the future development of the industry it must be left to science to find out more of the life-history and properties of the cotton fibre, and to carry out fundamental research into the chemical and physical changes introduced during manufacture, before the users of the fibre, in conjunction with the research staff, can make suggestions for the improvement of existing processes and machinery. For example, the study of the properties (botanical, chemical, and physical) of the single cotton fibre is fundamental to the whole industry. The fibre is of a complicated nature, consisting of differing chemical products enclosed in an outer skin or cuticle, and it is not known certainly whether some bleaching processes remove the cuticle, or how its presence or absence affects the feel, lustre, dyeing, and wearing properties of fabrics. The botanical side will also be concerned with the conditions of growth and breeding of the cotton plant, in so far as these affect the quality of the raw material, and it is hoped that this work will be carried out in the closest conjunction with the research department of the Empire Cotton Growing Committee.

The general purpose of research in cotton spinning will be to connect the properties of the raw cotton with those of the yarn it produces. Evenness of yarn is of importance to both the spinner and the weaver, but methods for improving this and other qualities demand in the first place accurate methods of testing them. During the exploration of this field precise information should be obtained as to the manner in which each existing machine carries out its various functions, and as to the effect of different properties of the raw cotton and of mixings thereof on these functions. Such measurements and information require the invention of special scientific instruments and methods for measuring the properties of raw cotton—*e.g.* length of staple, the diameter, strength, and elasticity of yarns and fabrics, and the effect of temperature and humidity on the spinning properties of the fibre.

The sizing problem is also one of great importance. It is not known, for example, why sizes prepared apparently in the same way should produce in some cases hard, and in others soft, warps, or what is the effect on the size of adding waxes, fats, and other substances, or how these affect the penetration of the threads, strength, and resistance to rubbing; nor is it possible in many cases to trace the cause of defective sizing to its ultimate chemical or physical source, or to predict from an analysis the exact sizing qualities of a given sample of material.

Many other problems could be alluded to—*e.g.* the effect of water and of steam at high and low pressures on the fibre, and the tendering of fibres

and fabrics by acids, light, and heat—but sufficient have been mentioned to show that the whole industry bristles with scientific problems awaiting solution.

In attacking these problems it is certain that a vast amount of purely scientific work will have to be undertaken. The association is fully alive to the fact that pure research has in the past, in this country at all events, been almost the monopoly of the universities; but the scientific workers of our universities have not, generally speaking, been sufficiently in communion with industry fully to appreciate the nature of the problems in pure science which any particular industry required to be solved. The association hopes to keep in close touch with the universities, and that by so doing the ties between the scientific workers and industry may become closer in future. Certainly the association looks to the universities for much help as regards both the pure research work which will emanate from them, and the skilled research workers trained by them.

There is a further way in which relations with the universities may become more intimate, for, owing to the generosity of some of its members, the association possesses a number of scholarships tenable at any university, two of which have just been awarded; it also has the power to endow scholarships and bursaries for the training of persons engaged in studying the principles involved in any of the industries using cotton, or connected therewith, and four such scholarships are now held at universities, two being provided jointly with the Empire Cotton Growing Committee.

The relationship with pure science cannot, however, be strengthened by a policy of the purely "take and be thankful" type; something must be given in return; and it is hoped that science will be enriched by the publication of the pure scientific research carried out in the Shirley Institute. More particularly may this be the case in connection with the development of the department of colloid chemistry and physics, representing as it does a branch of science which has received comparatively little attention in this country.

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Obituary.

LORD GLENCONNER.

BY the death, on Sunday, November 21, of Edward Priaulx Tennant, Baron Glenconner of Glen, the country has lost an appreciative friend of all good work, whether in the direction of art or of science, as well as a man of simple, lovable disposition and sterling character.

From his father, Sir Charles Tennant, the first baronet, Lord Glenconner inherited chemical works at Glasgow, to the business of which he attended; but his own tastes lay chiefly in the direction of forestry, natural history, and antiquarian pursuits. To study methods of forestry he had travelled in Germany and in many parts of the world, and his estates bear witness to the care bestowed on tree cultivation. It is well known that he purchased and gave Dryburgh Abbey to the nation a few years ago; and it is more than suspected that he had intended to do the same with Stonehenge had not another benefactor forestalled him. His house, which was characterised by admirable simplicity, was the resort of many distinguished persons, and his picture gallery was often thronged to hear about some discovery of scientific interest.

The loss of his exceptionally promising eldest son in the war was a profound grief to Lord Glenconner, from which perhaps he only half recovered; but he became convinced, and allowed himself to express publicly his conviction, of a reality underlying the old idea of human survival after bodily death.

REGINALD J. FARRER.

MR. REGINALD FARRER, whose death was reported in the *Times* of November 19, was an extraordinarily enthusiastic horticulturist, possessing, in a high degree, a poetic and artistic temperament, an experienced and intrepid traveller, and an accomplished and versatile writer. In horticultural circles he will be remembered as an ardent collector and cultivator of alpine plants, which he knew as few know them. He had studied them on many occasions in their native haunts, and had cultivated them under ideal conditions in his garden at Ingleborough. Many new plants, some of them of great interest and beauty, have been discovered and introduced by him into our gardens, enriching them, and at the same time making a valuable contribution to our knowledge of the flora of China and Tibet. As a geographer also Farrer will be known to many. The award of the Gill memorial medal of the Royal Geographical Society early this year was a recognition of the useful work he had done for geography in his journeys on the Chinese border of Tibet. His lectures before the society on these journeys were published in the *Geographical Journal*, vol. xlix., pp. 106–24, and vol. li., pp. 341–59.

Reginald John Farrer was a Yorkshireman, born forty years ago. At his home, near the beautiful Ingleborough Mountain, he had for many years made gardening, and especially rock gardening, a dominating interest. His natural rock garden is probably a unique example of such a garden in this country. In 1894, when a mere boy, he contributed to the *Journal of Botany* a note on the rare *Arenaria gothica*, which he had discovered in another station at Ingleborough some miles distant from that where alone it had previously been known in Britain. In 1898 he entered Balliol College, Oxford, as a commoner. Later he made several explorations in the European Alps with the special object of studying their vegetation. These explorations were described in