

brokers; but not one engineer, chemist, or man of science: at least the newspapers reported none as present. His Royal Highness did not notice the omission; it was an utterly trivial incident, of course. Straws show which way the wind blows.

Not one of the headmasters of the great public schools is a man of science, and very few of the heads of houses in the old universities; though the recent selection of a zoologist and a botanist to such posts of dignity at Cambridge may be a timely concession. If the headmasters and heads of houses are by training and tradition out of sympathy with science, is it astonishing that under-masters and schoolboys, as well as undergraduates, grow up ignorant of scientific method, and despise that of which they are ignorant? Worst of all, in those departments of our schools where science is admitted, it is treated as an inferior study. No doubt our public school system turns out many admirable cricketers and a few scholars; but of the living men who have made their mark in science, how few can thank the public schools for that achievement? At every general election the public—to judge from the Press—is keenly anxious to know how many of the members of the House were reared at Harrow, and how many at Eton. But no one cares how many Fellows of the Royal Society, or members of the Institution of Civil Engineers, or Fellows of the Institute of Chemistry are from Harrow or Eton.

We now suddenly discover in the cataclysm of a terrible war, not only that science has been at a discount in the organisation of the army, but that our industrial and commercial life is disorganised and crippled by the same elementary disregard. Nearly half a century ago Disraeli warned us that the commercial prosperity of a nation might be measured by the prosperity of its chemical manufactures. He was laughed at as though his dictum had been a joke. But it ceases to be a matter for joking when the neglect of science leads to the disappearance of whole branches of those trades that are concerned with the technical applications of chemistry or physics or metallurgy. The loss of the dye-stuff industry; the decay of several branches of the glass industry; the ever-increasing pressure in the metal industries, in the varnish industry, in the watch and clock industry, in innumerable branches of the engineering industries, are serious indications. They are symptoms that something has been rotten in the administration of the State. But they have not occurred without serious warn-

ing. Sir Norman Lockyer's weighty British Association address, Professor Perry's trenchant "Neglect of Science," Lord Haldane's earnest pleas for the improvement of education in the interests of national efficiency, all pointed the same moral: *if you neglect science, you do so at your peril*. But these warnings fell largely on deaf ears. The assistance given by Government to the promotion of science has been largely a sham supplemented by a few doles. Government has given, it is true, a large sum for the establishment of the National Physical Laboratory. But the German Government gives three times as much, and the United States Government four times as much, for their corresponding national institutions.

In its wisdom, the Government—not the present one—has merged the Science and Art Department in a Board of Education, a Board which never meets, under successive Ministers of Education, who, however able they may have been, have not in any case been men of eminence in science. In the Army there is unconcealed contempt for and hostility to the opinion of any civilian expert; he is lower than any mere gunner. Even the military engineer is set down as a mere sapper. In the Navy things are not quite so bad, though it required years of agitation to secure even a partial recognition for the naval engineer. Had science been despised in the Navy as it is in the Army, where would Britain have been to-day? In political and financial circles the contempt is complete; science neither goes out vote-catching, nor panders to Stock Exchange operations. It is therefore of no importance. Always, and ever, and again, science is despised and ignored.

If the public, the nation, and its appointed rulers display such blindness, is it wonderful that national interests, civil as well as military, industrial as well as agricultural, suffer grievously when forced to compete with nations sedulously trained in the cultivation of science?

And yonder march the nations full of eyes.
Already is doom a-spinning.

TWO MORE BANTU BOOKS.

- (1) *A Concise Kaffir-English Dictionary*. By J. McLaren. Pp. xv+194. (London: Longmans, Green and Co., 1915.) Price 3s. 6d.
- (2) *A Manual of the Chikaranga Language*. By C. S. Louw. Pp. x+397. (Bulawayo: Philpott and Collins, 1915.) Price 12s. 6d. net.

(1) IT is curious that so many industrious persons have issued, in the course of the last eighty years, one-sided dictionaries of Kafir (Xosa) dialect of the great Zulu language, and that no one that I know of has published a full

English-Kafir dictionary. Such works as those under review are, of course, valuable, but they would be twice as useful if, in addition to Kafir-English, an English-Kafir section was added. English-speaking people in South Africa will not find the work now under review of as much use or importance as philologists, because it will need endless searching to find therein the equivalent of some English word which they wish to translate into Kafir.

Mr. McLaren, in compiling the work under review, acknowledges his great indebtedness to the previously published monumental dictionary by Dr. Kropf, and to the great Zulu Dictionary of Bryant. Unfortunately, like most writers on the Kafir dialects, he adopts the South African orthography, which is devised without any regard to the existence of other languages in the world requiring to be spelt phonetically, and which ignored most of the suggestions made by Lepsius in his standard alphabet. To express the three or the four clicks used in the South African Bantu the letters *c*, *q*, and *x* are borrowed, oblivious of the fact that all are required and have long since been used in other phonetic systems to express the English *ch*, the Arabic ق, and the Greek χ. The Arabic guttural ق is of such common occurrence all over the world in languages too numerous to catalogue, that the symbol *q* is required for its expression, and is made use of more logically since this Semitic letter, borrowed by the Greeks and the Romans, had in Phœnician almost certainly the sound of the Arabic ق. In my own work on phonetic spelling, and in my study of the Bantu languages, which is gradually being printed by the Oxford University Press, I have been obliged to devise special type to indicate the clicks, because the symbols offered by Lepsius were too confusing to the eye when written or printed.

The term "Kafir" is, of course, exasperating to the logical mind, as it is nothing more than the Arab term "unbeliever," but it seems to have become permanently established in South Africa, and cannot be set aside—though why linguists like Mr. McLaren should wish to spell it with two *f*'s instead of one is what I cannot understand. There is no general term other than Kafir to include the closely allied western dialects of the Zulu species—Xosa, Tembu, Pondo, Pandomisi, Xesibe. The other well-marked dialects on the east and north are Zulu and Swazi. The "Añgoni" of Gazaland (reaching also to Nyasaland) is perhaps a fourth sub-species. To those who cannot afford the big, heavy, and expensive (but most valuable) Kafir-English Dictionary of

Dr. Kropf, the work under review will be useful, as it is light, compact, clearly printed, and priced at only 3s. 6d.

(2) Chikaranga is, as Mr. C. S. Louw informs us in his preface, the language spoken by the natives of Mashunaland in southern Rhodesia. It is a language divided into several well-marked dialects, and the general name of these is more correctly spelt (as it is pronounced) Karaña. The Karaña language is the southernmost member of that far-spread Nyanja group, which extends over the Shire basin half-way up Lake Nyasa, and includes most of the tongues of the lower Zambezi and of the Zambezi valley as far west as the vicinity of the Victoria Falls. The book under review is quite the best manual as yet published on this important speech. It consists of a grammar, exercises, and a copious vocabulary, virtually a dictionary, English-Karaña and Karaña-English. It is published by Philpott and Collins, Bulawayo, and it is a pity that no indication is given of any London agency, for the work is sure to be in request in that ever-widening circle of Bantu students, not only for its philological interest, but because a knowledge of Karaña is of really great importance to those who are proposing to settle and work in southern Rhodesia and adjoining portions of Portuguese south-east Africa.

H. H. JOHNSTON.

FINITE DIFFERENCES FOR ACTUARIES.

Elements of Finite Differences, also Solutions to Questions set for Part I. of the Examinations of the Institute of Actuaries. Second edition. By J. Burn and E. H. Brown. Pp. iii+289. (London: C. and E. Layton, 1915.) Price 10s. 6d. net.

THE first edition of this work, which is intended for students preparing for the first examination of the Institute of Actuaries, appeared in 1902. The present edition only differs from its predecessor in the addition to part i. of an alternative demonstration of Lubbock's formula for approximate summation, and of three chapters dealing with Stirling's Interpolation Formula, Interpolation for functions of two variables, and Interpolation of inverse functions.

The first two chapters give a clear and straightforward exposition of the elementary processes and formulæ. In the chapter on Interpolation, the usual Finite Difference methods and that of Lagrange are given. In the case of a function which is given for *n* non-equidistant values of the variable, it is suggested that a possible method of procedure is to assume

$$U_x = A + Bx + Cx^2 + \dots + Dx^{n-1}.$$