

grow out; the main root apex also grows very slowly or not at all in water, whilst branch roots develop freely. Numerous measurements on the growth of marked roots and some observations and experiments upon absorption by them are described, and the regions of the roots, growing in air and soil, are briefly compared in their anatomy.

*Experimental Mechanical Engineering: for Engineers and for Students in Engineering Laboratories.* By Prof. Herman Diederichs and Prof. William C. Andrae. Vol. 1: *Engineering Instruments.* Pp. viii + 1082. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1930.) 40s. net.

THE precise methods of the physical laboratory have long since been applied in the realm of engineering practice. In workshops, factories, engine-rooms, and steel-works, scientific apparatus is found in ever-increasing quantity. Specifications are drawn up with scientific accuracy and contracts have to be carried out within fine limits. Not only during tests, but also as a matter of daily routine, records of pressure, temperatures, velocities, volumes, and analyses have to be taken at frequent intervals, and every engineer must be something of a physicist. Of the scientific apparatus in use, there is an endless variety constantly being added to, and the need of an authoritative text-book on the subject is apparent.

To meet this need, the authors of "Experimental Mechanical Engineering" have compiled this work on engineering instruments, their construction, use, and calibration. Chapters deal in turn with the measurement of length, area, time, speed, pressure, temperature, work and power, liquids, gas, vapours, and fuel analysis, exhaust and flue gas analysis, and lubrication. They are well illustrated by diagrams, and references are given to the sources of information. This is a book which should be in the library of every technical college, every drawing office, and of every engineer who is concerned with the testing and running of plant. A second volume is to be published to cover the testing of power plant apparatus as laid down in the codes of the American Society of Mechanical Engineers.

*Plants of the Gold Coast.* By Dr. F. R. Irvine. Pp. lxxix + 52 + 32 plates. (London: Oxford University Press, 1930.) 5s. net.

THE author of this work, who is master of agriculture and biology at Achimota College, is anxious to commit to print the vernacular names of plants of the Gold Coast and their relevant proverbs, with interpretations, before they are forgotten in the changed conditions of modern life. The work has been undertaken mainly to help African teachers and other Africans who are willing to take an interest in their flora.

The introduction contains much of interest, amongst which the author summarises his investigations into plant lore, herbalism, and the economic uses of local plants. A list of economic plants shows the species grouped according to their value for oils,

fibres, timber, drugs, etc. The lists of native names are a valuable record. They are written in the new and unfamiliar script recommended by Dr. Westermann and the International Institute of African Languages and Cultures. The greater part of the book consists of an enumeration of the plants, with brief descriptions and notes on plant lore, in English. The arrangement is alphabetical, under the botanical names. The author welcomes suggestions for a future edition. The experience he will gain in the meantime will undoubtedly lead him to reconsider the scope of the work.

There are some good representative photographs of the vegetation and a few line drawings. The low price of 5s. is due to the financial assistance given by the Gold Coast Government to enable the author to achieve his object and place his book before the Gold Coast people.

*A New Algebra for Schools.* By Clement V. Durell. Parts 1 and 2. Pp. ix + 328 + xxiv + xxiii + xv. (London: G. Bell and Sons, Ltd., 1930.) Without Appendix: with Answers, 3s. 6d.; without Answers, 3s. With Appendix: with Answers, 4s. 6d.; without Answers, 4s.

THIS book has been written for the ordinary pupil, and an excellent course has been devised whereby the initial difficulties in algebra, due largely to the symbolic notation, may be overcome. In the early stages, the student is trained to think in numbers when using letters. Simple practical formulæ are then developed in such a way as to exhibit the utility of the notation. The volume, embracing parts 1 and 2, each corresponding to a normal year's work, carries the subject up to quadratic equations, and a characteristic feature lies in the numerous illustrations drawn from geometry, physics, and mechanics. At the present time, when progressive teachers are strongly advocating a greater degree of unification in school mathematical subjects, such a book as this is very welcome. There is an abundance of exercises to meet the needs of both ordinary pupils and those of special ability.

*An Index to the Chemical Action of Micro-organisms on the Non-Nitrogenous Organic Compounds.* By Prof. Ellis I. Fulmer and Prof. C. H. Werkman, assisted by Anella Wieben and Calvin R. Breden. Pp. xiii + 198. (London: Baillière, Tindall and Cox, 1930.) 20s. net.

THIS book is a useful aid to biochemists wishing to know where to obtain information about the chemical action of micro-organisms. The contents are tabulated to show the action of each organism on all the substrates which have been examined and in each case the products found, the authority, and the reference to the literature. Each item is cross-referenced under "Substrate" and again under "Products". So far as the writer has been able to test it, the information is fairly complete. The present instalment deals only with organic, non-nitrogenous substances, and it is to be hoped that a further section dealing with other substrates will soon appear.