

the value of a biological outlook to the school-child applies *a fortiori* to the adult. But here again, extra-mural university teaching is largely bound up with the Workers' Educational Association. This excellent educational organisation, however, is hampered by the constitutional custom that the adult students *ask* for whatever classes they feel they want. As a result, adult education has come to be looked on as largely a development of the Faculty of Arts. The grown-ups ask for subjects such as psychology and economics, that naturally appear to them to bear directly upon their own lives. They do not realize that the subjects they choose are, as often as not, far beyond their mental capacity; in fact, as some of us think, they are beyond the capacity of the ordinary undergraduate. If they could be encouraged to study in a simple and broad manner the elements of biology, then a great step forward could be made in education generally.

CHROMATOGRAPHY FOR GENERAL CHEMICAL ANALYSIS

ORIGINALLY used for coloured substances chromatography has been extended to deal with a wide range of colourless materials, by the use of suitable coloured derivatives or of indicators. Sugars and related substances form an important class of this kind, for which chromatography has proved to be a powerful analytical tool, particularly within the last ten years.

Messrs. Binkley and Wolfram* have themselves made important contributions to the subject, and their pamphlet appears at an appropriate time, when work in this field is expanding so rapidly; it provides carbohydrate investigators with an up-to-date historical review and practical details of the techniques involved. The first section of this pamphlet gives a simple general description of the adsorption chromatogram, with various details, such as selection of adsorbents, construction and operation of the chromatogram and location of zones after development. The second section provides a comprehensive review of the literature up to the end of 1947. Most of this section deals, of course, with adsorption chromatography, since it is only very recently that partition chromatography, particularly on paper, has been applied to the sugars. The third section describes with experimental details some of the applications of chromatography to sugars; for example, resolution and quantitative estimation of mixtures, purification, control in the production of technical sugar products and end-group assay.

Similar in size and presentation, "Introductory Notes on Chromatography"† covers a much wider field, including vitamins, alkaloids, chlorophylls, carotenoids, vegetable and mineral oils, amino-acids, inorganic ions and many other substances. Some of the applications are given detailed treatment in order to illustrate methods suitable for use in analogous cases. A useful list of references is given, most of which occur within the last ten years, and, as in the case of the first pamphlet, most of the chromatography described is of the adsorption type. This pamphlet succeeds in condensing a great deal of

information into its forty pages and will be found useful as an introduction to the well-known textbooks on chromatography.

Workers in both academic and industrial fields will find information of value in these two pamphlets, which are clearly written and attractively produced. Those who have not already adopted chromatographic techniques will be encouraged to do so after reading them. Chromatography may well prove to be indispensable in many investigations.

During the past year, the range of separations has been greatly widened by the partition chromatogram and by chromatograms which are neither clearly adsorption nor partition. Among recent advances in chromatography may be mentioned the use of dinitrophenyl derivatives of amino-acids and peptides, the use of radioactive isotopes, and the employment of new kinds of supporting media or modifications of existing media in partition chromatograms for the purpose of dealing with non-aqueous solvent systems. The present period is thus one of rapid development, and it is therefore desirable that information on the most recent advances in chromatography should be made available from time to time and with little delay. Perhaps this information might be issued in the form of pamphlets similar to those reviewed here.

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NEW CHEMICAL LABORATORIES AT UNIVERSITY COLLEGE, DUBLIN

By PROF. T. S. WHEELER

THE honours degree courses in science in University College, Dublin, have recently been extended by one year so as to require four years of post-matriculation work. After three years, the student sits for a general degree examination in three subjects, and if he passes and attains an honours level in a subject is admitted to the honours school in that subject. A number of students, however, who wish to become chemists pass the general degree examination at a level in chemistry insufficient to qualify for admission to the honours school. For those and for other students, who though qualified for honours study feel attracted towards industrial chemistry, there has been instituted a course which extends over one year and leads to a diploma in chemical technology. To provide accommodation for the two types of fourth-year students two new chemical laboratories have been opened (see *Nature*, November 13, p. 768), the Ryan Laboratory for honours degree students and the Nolan Laboratory for those taking chemical technology.

The Ryan Laboratory commemorates the late Prof. Hugh Ryan, who was professor of chemistry in the College during 1899-1931 and who initiated honours degree teaching there. The laboratory has a floor area of 460 sq. ft. and will accommodate up to ten students; as formal lectures to honours candidates are limited to five per week, a large proportion of the students' time is spent in the laboratory. There is no specialization between the three main branches of chemistry in the fourth year, and in the Ryan Laboratory normal advanced work in inorganic and organic chemistry is carried out; practical physical chemistry is done in a special laboratory. Emphasis is

* "Chromatography of Sugars and Related Substances," by W. W. Binkley and M. L. Wolfram. (Scientific Report Series No. 10. Sugar Research Foundation, Inc., New York.)

† "Introductory Notes on Chromatography." (British Drug Houses, Ltd., Poole.)