extraction method used by Davis, Daish, and Sawyer results in the formation of appreciable amounts of aldehyde, and this affects considerably both the cupric reduction and the optical rotation.

Such work as has been quoted sheds no light on the exact position of the various sugars in the leaf. Strakosch some years ago applied certain microchemical tests to the assimilating leaf, and found hexose as the only sugar present in the palisade cells; but the reliability of his method is open to question. The work of Weevers on variegated leaves, published in 1924, is probably of greater value in support of the glucose view. He found both hexose sugars and sucrose in the green parts, but only sucrose in the white portions of the leaf.

The balance of evidence at the present time would seem to be in favour of the original supposition that glucose is the first sugar to be set free in photosynthesis. On the alternative view, the two hexose sugars are easily accounted for as the inversion products of the sucrose. But on the assumption that glucose appears first, then one has to imagine that part of it is first changed to fructose (levulose), and that from these two hexoses sucrose is synthesised. If these transformations do take place in the leaf, we are at present quite ignorant as to the means by which they are brought about.

Whatever may be the carbohydrate sequence in photosynthesis, there is cumulative evidence pointing to cane sugar as of wide, if not of universal, distribution among the higher plants. Apparently it is of fundamental importance, since no matter what form the carbohydrate may take in the seed or reserve organ, sucrose soon makes its appearance on germination. The evidence is increasing that carbohydrate can travel largely in this form. Mason and Maskell's important work on the cotton plant [9] favours this. Then, again, as a rule, leaves when fed with sugar solutions form starch more readily from sucrose than from any other sugar. Notwithstanding this apparent desire of the plant to have its carbohydrate in the form of sucrose for circulatory and metabolic purposes, there is no important reserve carbohydrate which yields cane sugar directly by enzymatic action!

In view of the fact that starch, the commonest of reserve carbohydrates, yields maltose when acted upon by its enzyme, diastase, this disaccharide rather than sucrose might have been expected to be chiefly evident in plant tissues; but it is not so. It may be that a non-reducing disaccharide is desired. Maltose has reducing properties, but sucrose has not. Then it has been suggested that the two hexose sugars, dextrose and levulose, which arise from the sucrose through inversion, may play different rôles in metabolism. Further, it is possible that these hexoses are more active when in the nascent state, that is, at the moment of their formation from sucrose through hydrolysis. This would account for cane sugar being found in meristematic tissue, upon which Priestley [10] laid stress a few years ago. J. P.

[1] *Biochem. Zeit.*; 1926.
[2] *Biochem. Jour.*, **24**; 1930.
[3] *Proc. Roy. Soc. London*, 1927 and 1929.
[4] *Jour. Chem. Soc.*; 1893.
[5] *Biochem. Jour.*; 1911.
[6] *Jour. Agric. Sci.*; 1916.
[7] *Bot. Gaz.*, vol. 89.
[8] *Biochem. Jour.*, vol. 24.
[9] *Ann. Bot.*; 1928.
[10] *New Phytologist*; 1924.

Obituary.

PROF. HUGH RYAN.

BY the death on Mar. 27 of Prof. Hugh Ryan at the age of fifty-eight, Irish chemists have sustained a loss which they will feel for many years to come.

Hugh Ryan was educated at Blackrock College, Dublin, and received his earlier chemical training under Prof. A. Senier in Queen's College, Galway. Graduating in 1895, he obtained the M.A. degree, with gold medal, in 1897, and then proceeded to Berlin, where he engaged in research under Emil Fischer and Siegmund Gabriel. Returning to Dublin in 1899, he was appointed professor of chemistry in the Catholic University School of Medicine and in University College, St. Stephen's Green, Dublin. In the same year he was awarded the D.Sc. degree and appointed fellow of the Royal University of Ireland. On the foundation of the National University of Ireland in 1908, Ryan became professor of chemistry in University College, Dublin, a position which he occupied until his death. In 1924 he was appointed Chief State Chemist in the Irish Free State and was responsible for the organisation and control of the State Laboratory.

Throughout the entire period of his association with university teaching, Ryan devoted a large part of his time to research and published more than seventy papers. In his earlier work, influenced by his period with Fischer, he was engaged on the synthesis of glucosides. His researches in this direction, carried out under the most discouraging conditions, display his extraordinary enthusiasm and skill as a chemist. With the erection of the new buildings of University College, Dublin, under the Irish Universities Act of 1908, he had, for the first time, adequate laboratory equipment, and his remarkable powers as an organic chemist were given fuller scope. There followed a series of researches on the constitution of certain waxes and the preparation of a number of compounds allied in character to the colouring matter of turmeric. Further papers dealt with the synthesis of natural organic colouring matters and the preparation of derivatives of diflavone, diflavanone, and dicoumaranone. At the request of Nobel's Explosives Company, he undertook investigations on the mode of action of stabilisers in propellent explosives, the results of which were of the greatest value. Numerous other papers discussed the condensation of aldehydes with ketones and the structure of catechin. Ryan's many activities included a profound interest in Irish peat industries, and on this subject he furnished a very complete report to the Royal Dublin Society.

While his main interests lay in the direction of organic chemistry, the extraordinary breadth of Ryan's knowledge of all branches of chemistry always aroused the admiration of his colleagues, both in Great Britain and Ireland. To Irish men of science his great achievement was that he created in Dublin, from small beginnings and almost unaided, an important school of research in chemistry. The range of his influence in this respect, already widely felt, will be more fully appreciated in the future.

In public and private life Hugh Ryan was a most lovable and sterling character, with a rare simplicity and charity of outlook. His untimely death will cause genuine grief among the many students of science, engineering, and medicine who received instruction from him. J. ALGAR.

WE regret to announce the following deaths:

Dr. T. V. Barker, secretary to the University Chest in the University of Oxford, author of numerous books and papers on mineralogy and chemical crystallography, on April 15, aged fifty years.

Prof. E. P. Culverwell, senior fellow and professor of education in Trinity College, Dublin, who was known for his work on the calculus of variations and mathematical and physical theories of the Ice Age, on April 17, aged seventy-five years.

Prof. J. Lorrain Smith, F.R.S., professor of pathology and dean of the faculty of medicine in the University of Edinburgh, on April 18.

The Ven. J. M. Wilson, sometime canon of Worcester and headmaster of Clifton College, who was a member of a British Association committee on science in schools so long ago as 1866, on April 15, aged ninety-four years.

News and Views.

THE preliminary programme has now been issued of the centenary meeting of the British Association, to be held in London on Sept. 23–30, under the presidency of the Right Hon. J. C. Smuts. So far, of course, only the barest outline of the proceedings is possible, but it is clear already that the meeting is going to be worthy of the occasion. The reception room and offices for the meeting will be in the University of London (Imperial Institute Road, South Kensington). General Smuts will assume office at a meeting in the afternoon of Sept. 23 in the Albert Hall, where the Faraday Centenary Exhibition is being held, and will deliver his presidential address on the same evening at the Central Hall, Westminster. Special tickets will be required for General Smuts's address; arrangements are being made for relaying it to other halls if necessary. Evening discourses will be given by Prof. W. A. Bone (photographic analysis of explosion flames), Sir P. Chalmers Mitchell, Sir Arthur Keith, Sir Oliver Lodge (a retrospect of wireless communication), Sir William Hardy, and Sir James Jeans. The Huxley Memorial Lecture of the Royal Anthropological Institute will be delivered on Sept. 29 by Dr. G. Thilenius, and members of the Association are invited. Various public lectures will be given in certain polytechnic institutions in London. It is expected that receptions will be given on Sept. 24 by the Royal Society, in connexion with the Faraday celebrations, and on Sept. 25 by H.M. Government. Exhibits and demonstrations are again being arranged by the British Broadcasting Corporation. London and its neighbourhood will provide plenty of opportunities for sectional excursions. Down House, Darwin's home for many years and now in the care of the Association, is within easy reach, while an invited party will visit York, the birthplace of the Association, on Sept. 26–27. Preceding the meeting will be a geological excursion to East Anglia on Sept. 16–22, and those wishing to take part are requested to communicate with Mr. I. S. Double, University, Liverpool, as soon as possible.

THE formative influence upon the teaching of science in schools which was exerted by Canon J. M. Wilson, whose death has recently occurred, was evident so far back as 1866, when he was a member of a committee with Dean Farrar, Prof. T. H. Huxley, and Prof. J. Tyndall, appointed by the British Association at its meeting at Nottingham, "To consider the best means of promoting scientific education in schools". The report of this committee was issued in 1867 and laid stress on science as an essential subject in the curriculum, not necessarily to train physicists and chemists but as an effective instrument in mental development. The subjects suggested in the report were elementary physics, elementary chemistry, and botany. Canon Wilson, in a paper on "Teaching Natural Science in Schools", published in 1867, gave an account of methods adopted in introducing science teaching in Rugby School. He selected botany as the best subject for beginning to train boys in scientific method. This was followed by experimental physics. By his choice, he seems to have anticipated the present-day position of botany in the school curriculum, at any rate, from the theoretical point of view. There is much discussion on the position of botany, or elementary biology, in the school curriculum, but there is still much to be done in a practical way. There are comparatively few secondary schools, especially for boys, where science is introduced by botany or biology, as it was sixty-five years ago under Canon Wilson at Rugby. The sole idea in Canon Wilson's mind was to train independent observation and reasoning, not to supply the biology 'demanded' by the first examination for medical and dental degrees and diplomas, which some of our public and secondary schools are now doing with not quite satisfactory results.

ON April 28, one hundred years ago, the eminent mathematician and physicist, Peter Guthrie Tait, was born at Dalkeith. Educated at Dalkeith Grammar School and the Edinburgh Academy, in 1847 he entered the University of Edinburgh and the following year became an undergraduate of Peterhouse, Cambridge. At the age of twenty-one, he graduated as Senior Wrangler, being the youngest on record. He was also Smith's prizeman. Two years later he was appointed professor of mathematics in Queen's College, Belfast, having Andrews for one of his