points in the same direction; but documents of the Twentieth and Twenty-first Dynasties indicate on one hand a breakdown of the old system sufficiently complete to allow of the development of a currency of sorts (the *shati*), and on the other commodity, for example, fish, of which this weight indicated their allowance. It may be asked if this evidence should not be taken to indicate that in earlier times also weights were used for such a purpose. To us it must seem extraordinary that

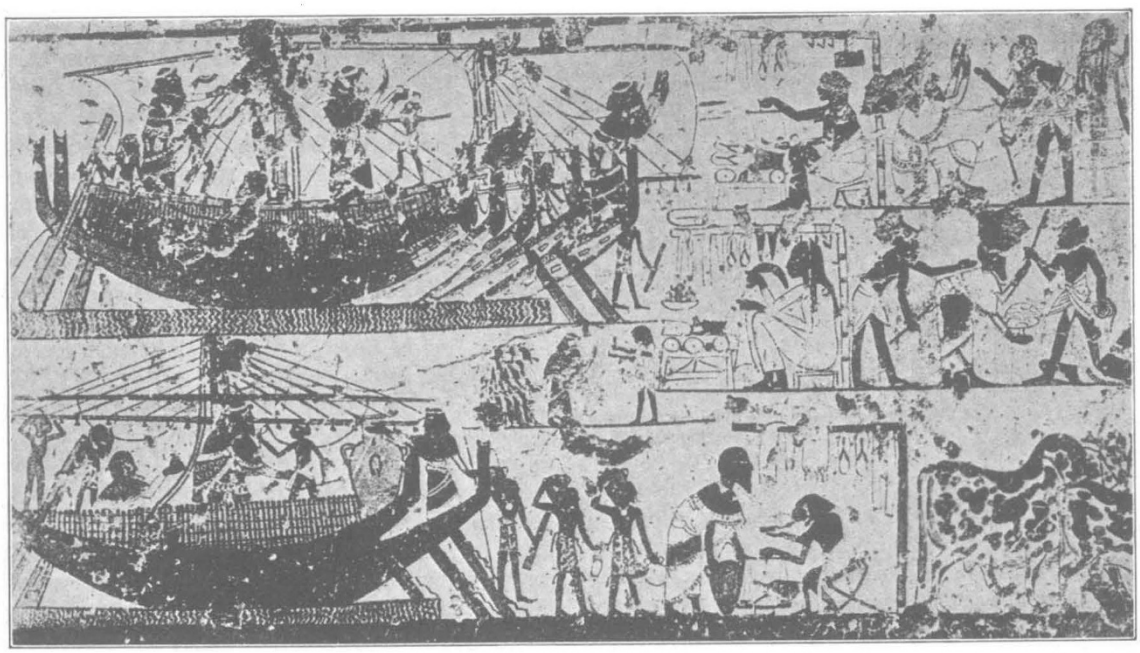

FIG. 4. Egyptian harbour scene: the balance in use for private transactions (*c.* 1250 B.C.). After a Theban tomb painting.

the essence of the old estate-cum-barter system being used by the Crown as in earliest times in its relations with the workmen employed on its monuments, who receive payment in food and commodities. Weights have been recovered with the names of the workmen and the name of the weights should have been used for more than two thousand years for one purpose only, before they were adapted for the direct weighing of commodities as we use them to-day. Until further information is available, it is unwise to speculate on this point.

The British Association

A FIVE-YEARS' RETROSPECT, 1931-35

FIVE-YEARS' PLANS are popular nowadays, and some of their begetters may have cause to remember with a wry smile Johnson's remark to Reynolds that "There are two things which I am confident I can do very well: one is an introduction to any literary work, stating what it is to contain, and how it should be executed in the most perfect manner; the other is a conclusion shewing from various causes why the execution has not been equal to what the authour promised to himself and to the publick".

The British Association has never, so far as we know, committed itself to any grandiose scheme of planning; but with the beginning of its second century, it has adventured upon a new course. As each quinquennium passes, the Association proposes to issue a review of its work—especially that work which arises out of the activities of the annual meeting, and is carried on in the intervals between the meetings. The first number of the series has just appeared.

The descent of two or three thousand members on a town in early September always causes something of a commotion. The livelier dailies blaze out into headlines which tell how a "Woman Scientist Amazes her Male Colleagues"; the sedater journals reflect on the potency of the weapons which science puts into the possession of

communities not, perhaps, as yet competent to use them wisely; the week passes, and the Association fades from public view.

Many of its members, even, fail to realise that the activities of the Association are, in the language of this retrospect, perennial. Its Council meets six times in the year, and deals carefully and exhaustively with various resolutions and recommendations which have been sent in from the Sections at the annual meeting. Many of these resolutions involve difficult points of local and national policy, and the consideration of the best methods of implementing them involves much labour on the part of the officers and of the Council. In the quinquennium under review, such diverse topics have been discussed as an inland water survey for Britain, the preservation of the countryside and national parks, the extermination of the musk-rat, the revision of Ordnance Survey maps, the aerial photography of topographical features, the diseases of the cricket-bat willow and the interchange of museum specimens—a selection which covers but a small fraction of the resolutions put forward in this period.

The work of the Association's research committees goes on steadily throughout the year; its volume and importance are, perhaps, scarcely appreciated at their true value, and the summary which appears in this retrospect is specially welcome.

The average number of research committees appointed or reappointed at each annual meeting during the period 1931–35 was no less than fifty-two, and the total expenditure on grants to research committees during this period was £6,174 (the average quinquennial expenditure on grants since 1831 has been £4,900.)

The Seismology Committee, with hospitality and some financial assistance from the University of Oxford, has continued the publication of the International Seismological Summary initiated by the late Prof. H. H. Turner. A catalogue of earthquakes from 1925 to 1930, based on the Summary, has been compiled by Miss E. F. Bellamy and published by the Association.

The Mathematical Tables Committee has earned the gratitude of all working mathematicians; the tables calculated and published under its direction have been issued in five volumes, the latest of which is a massive volume of factor tables published in 1935. Three volumes of tables of Bessel functions are in preparation, the first of which is in the press.

The freshwater biological station at Wray Castle, Windermere, originated in proposals put forward at the 1927–28 meetings of the Association, and the Association continues its support of the researches carried out here, at the marine laboratory at Plymouth, and at the zoological station at Naples.

It is impossible in a brief review even to catalogue the names of the committees. Committees on documentary and educational films, on the reliability of the criteria for the assessment of the value of vocational tests, on educational training for overseas life, on the teaching of general science in schools, on an inland water survey, on the reduction of noise—these may serve to show the variety and importance of the problems under consideration. It will be seen that many of these problems demand for their solution collective, sometimes national, action, and the Association's reports have in many instances served to influence and to direct the course of action to be taken. It is to be remembered that the reports of these committees are not only critical surveys of, and deductions from, existing knowledge. In a number of cases (the Committee on Noise, for example), the committees initiate and carry out definite schemes of experimental research.

One of the most congenial, if most responsible duties of the Association is that of guardian of Down House which, through the generosity of Sir Buckston Browne, it holds in trust as a national memorial. An average of 7,000 visitors is recorded for each year of the quinquennium, and the Genetical Society has set an example to other societies by holding one of its meetings at Down House in 1934.

Darwin's study seems more uncannily alive than ever. His books, which have been lent to Down House by the professor of botany in the University of Cambridge, have now been restored to the study which, in the careless order amongst disorder of its arrangement—specimens and opened letters on the table, microscope on the broad window-ledge, couch drawn into a convenient position for reading—might almost be in daily use. An onlooker, absorbed in the atmosphere of the room, would scarcely be surprised were he to hear the clink of the snuff-jar lid in the hall outside the study.

Down House is an invaluable national asset; it is a constant reminder of the work and personality of one of the greatest and most lovable minds that the nineteenth century produced. But it is the desire of the Association to make Down House something more than this, and the Association hopes to see the house a centre for appropriate regular scientific research. A beginning has been made, and in the next quinquennial report the Association hopes to record the fact that such work is well established.

In respect of its membership, the Association has outstripped all previous records, for in all its history there is no other succession of five years

in each of which its members have exceeded two thousand. The statistics for the quinquennium are shown in the accompanying table :

Meetings of the Association

Year	Place	President	Membership
1931	London	Gen. Smuts	5702
1932	York	Sir Alfred Ewing	2024
1933	Leicester	Sir F. G. Hopkins	2268
1934	Aberdeen	Sir J. H. Jeans	2938
1935	Norwich	Prof. W. W. Watts	2321

It is a remarkable record and one that may well stimulate the Council to widen the already wide activities of the Association, and it is no secret that the Council has in consideration the possibility of a considerable increase in the Association's work. Regular research at Down House and the initiation of quinquennial reports on the progress of science—reports which shall elucidate to the non-specialist recent developments in scientific knowledge—are two instances out of many possibilities.

But increasing activities mean increased liabilities, and such liabilities emphasise the necessity for increased endowments. In the quinquennium under review, the Association has received legacies of £2,000 from Sir Charles Parsons, £500 from Sir Alfred Ewing, £1,000 from Mr. Bernard Hobson, and a gift of £1,000 from the local Committee for the Leicester meeting. On the other hand, the Centenary Fund appeal, coming as it did at a time of financial stress, failed in its object, and the gift of £10,000, made in 1926 by Sir Alfred Yarrow, was made under the condition that it should be completely expended not later than 1947. The remark of Sir Josiah Stamp that "further endowment will be essential to consolidate the position which the Association has attained at the end of its first century" is very pertinent.

The Association is to be congratulated on the production of an interesting and valuable survey of the work of five very full years.

Obituary

Prof. J. Stoklasa

WITH the death in Prague on April 4 of Prof. Julius Stoklasa, agricultural chemistry has been deprived of one of its most active and distinguished exponents. Born on September 9, 1857, at Leitomischl in Bohemia, Stoklasa early showed his interest in science, and when only eleven years old was appointed curator of the school natural history collection. At the early age of sixteen years he developed an interest in plant nutrition and carried out experiments on the water culture of plants ; the results he obtained were communicated to the famous plant physiologist Prof. J. Sachs, who replied at some length and encouraged the young worker to continue his experiments with the view of publishing them.

At about this time, Stoklasa commenced a study of the effect of sulphurous acid, hydrochloric acid and hydrofluoric acid on plants, which study proved to be a forerunner of the work published fifty years later under the title of "Beschädigung der Vegetation durch Rauchgase und Fabriksexhalationen". During the same period of his life, Stoklasa became interested in geology, and as a result of this he undertook a study of the weathering of rocks. Leaving school, he proceeded to the Agricultural Institute in Liebwerd, where his knowledge of inorganic chemistry, acquired at school, stood him in good stead and enabled him to take up the investigation of the quantity and quality of the salts valuable to plants which were carried away yearly by the River Elbe.

From Liebwerd, Stoklasa went to the Agricultural College in Vienna, where, working in the laboratory of Dr. Zeller, a son-in-law and a former assistant of Liebig, he published several investigations on plant biochemistry. On becoming *Privatdozent* at the University of Vienna, he worked in the plant physiological institute of Prof. Wiesner. Leaving Vienna, he went to Leipzig to study under Pfeffer and Ostwald, and obtained his doctorate for a thesis on the physiological properties of the water-soluble compounds of phosphoric acid contained in superphosphates. Recognising the importance of bacteria in the soil, he proceeded to Paris to study bacteriology at the Pasteur Institute, and on his return to Vienna he began to study the assimilation of atmospheric nitrogen by bacteria and plants.

For the next few years, Stoklasa was engaged in investigating the influence of phosphates and basic slag and other artificial manures on plant life. Starting an experimental station for beet sugar production in Prague, he became director of the section dealing with the physiology and pathology of the sugar beet ; this gave him ample scope for his talents, and he proceeded to undertake an intensive study of nitrogen fixing and of denitrifying bacteria, and published a monograph on the phosphorus cycle in the soil.

Stoklasa's studies on intra-molecular respiration and the isolation of zymase from plants and animal sources were of fundamental importance. A study of soil fertility led him to investigate the significance of soil respiration in cultivated areas, and in 1926 he published a book entitled "Biophysikalische und biochemische Durchforschung des Bodens". He made important contributions to our knowledge of the physiological significance of phosphorus, sulphur, selenium and other elements, and published lengthy papers on the importance of potassium to the sugar