

## A NEW SACCHARIMETER.

ONE of the many optical instruments which the English opticians have allowed the Germans to supply almost entirely is the saccharimeter. This instrument used to be made by Browning, but in late years nearly every instrument purchased in England has come from Berlin from the firm of Schmidt and Haensch, who make several designs of large and small instruments. It is therefore a pleasure to find an English firm—Messrs. Bellingham and Stanley, of London—making a saccharimeter which introduces valuable improvements on the German design. The one to which we refer is of the half-shadow type with quartz compensating wedges, but instead of the usual long wedge of which the movement is read direct by a scale and vernier, this one has a short wedge of larger angle. The wedge is moved by a screw, and the movement is read on a large drum with an open scale and sliding pointer.



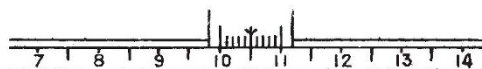
New short-wedge saccharimeter.

The whole length of the scale is some 2 ft. instead of  $1\frac{1}{2}$  or 2 in., and it can thus be read with great ease.

In instruments making use of a quartz wedge of the usual length (about 3 cm.), the scale is nearly always uneven, and unless calibrated introduces errors amounting to several tenths of a degree Ventzke. According to Landolt this is due to the quartz, which he describes as "a poor material optically"; he says that one seldom finds faultless plates, and that a pure wedge 3 cm. long is rare. Hence the value of the short wedge of Bellingham and Stanley which is less than half the usual length. The advantage of such a wedge, even if the quartz is not of special quality, is greater than would appear at first sight, since the field is due to the *average* effect of the whole of the light passed through the wedge, and this average will vary evenly through the small change of area of the wedge due to its movement, and thus the scale will be regular in spite of variations in the quartz; also it is easier to get repeated readings, owing to the greater ease with which the setting can be made with the fine adjustment given by the series, as compared with the usual rack and pinion motion. In fact, the

makers state that they have not detected any calibration errors in their instruments.

Another valuable feature is the enclosure of the scale and all working parts, so that they are protected from the salt vapours. The importance of this needs no emphasis to those who have had experience with instruments of this character. The corrosion of the



Scale of saccharimeter.

metal work—especially steel work—and of the scale, when as in the higher priced instruments this is engraved on silver or nikelin, under the action of the fumes in a laboratory often renders the instrument almost unusable in a few years. The instrument is mostly constructed of an aluminium alloy, protected by a black-stoved enamel, and no steel is used except for a small spring, which is entirely enclosed.

The optical work is of the first quality. The dividing line is sharp and clean, and the field evenly illuminated, so that adjustment for equality can be made without ambiguity, and with corresponding accuracy. The makers calibrate the scale at a number of points by direct reading against a polariser rotated on a divided circle. In the instrument examined the divisions were in half degrees "Ventzke" (of which 100 correspond to  $34.68^\circ$  of arc, for sodium light at  $17.5^\circ$  C.), and it was easy to estimate to tenths of a degree, *i.e.* to less than three minutes of arc. The design and workmanship were all that could be desired.

The same firm is also making refractometers of the Abbe and Pulfrich type and other optical instruments.

## OUR OVERSEAS MUSEUMS.

THE British Museum, the parent and model of the museums scattered throughout our Empire, stands alone in that it has no journal of its own wherein to record the work done by its staff, though from time to time special memoirs and reports are published by the Trustees. There is much to be said for the publication of a museum journal, and not the least important of its functions would be to afford the general public an index of the magnitude and scope of its work, which can now only be estimated by laborious compilation from the annual "blue-book" or the publications of the various learned societies.

A measure of the nature of the work performed by the staff of a properly organised museum can be gauged by a survey of the journals and "records" relating to the museums of our colonies and of our Indian Empire. For the most part the contents of such journals are of necessity of a highly technical

character, as, for example, the series of papers in the "Records of the Indian Museum" for April. If any of these are to be chosen for special mention it must be the profusely illustrated "Contribution to a Knowledge of the Terrestrial Isopods of India," by Mr. W. E. Collinge, describing a collection of species new to science from the Madras Province of Southern India.

The *Journal* of the Federated Malay States Museums for March contains a valuable paper on the zoology of Koh Samui and Koh Pennan by Messrs. H. C. Robinson and C. Boden Kloss, and another on the plants therefrom by Prof. H. N. Ridley; while the April number contains a most interesting summary of Malay filigree work by Mr. I. H. N. Evans.

The thirteenth report of the Sarawak Museum contains a complete list of all the mosquitoes known from Borneo. The material for this was collected by the curator, Mr. J. C. Moulton—now on active service in France—and determined by Mr. F. W. Edwards, of the British Museum.

The Report of the South African Museum contains a brief summary of the acquisitions of the Geological Department, some of which are of considerable importance, as, for example, the remains of a small dinosaur from Bushmanland, apparently allied to the Cretaceous dinosaurs, and which throw light on the age of the old land surface in the north-west of the Cape Province.

The Records of the Albany Museum for May contains seven papers, one of which, on the fleas infesting various wild South African mammals, may prove of more importance than would appear at first sight.

All these institutions appear to be in a flourishing condition, but this is evidently far from true of the Rhodesia Museum, Bulawayo, which, in its thirteenth annual report, complains bitterly of the lack of funds. So seriously has its income fallen off that it has been necessary not only to reduce its staff, but to suspend even work necessary to ensure the well-being of the collections. We trust that better days are in store for the Albany Museum.

#### ENTOMOLOGICAL WORK IN CANADA.

RECENT publications of the Entomological Branch of the Canadian Department of Agriculture illustrate the wide field of the activities of Dr. Gordon Hewitt and his staff and the advances they are making in our knowledge of the control of insects.

In the *Canadian Entomologist* for March, 1915, Dr. Hewitt discusses the hibernation of the house-fly in a paper that is of very great topical value at the moment in this country; he finds that the maggots pupate at depths up to 2 ft. below and away from a manure heap, where this is situated on sandy loam; he finds also that the flies emerge from this situation. Discussing the hibernation of the insect, he reiterates his belief that it is as the adult that they live over the winter in northern latitudes.

In the *Transactions* of the Royal Society of Canada for September, 1914, Dr. Hewitt describes observations on the feeding of the stable-fly, *Stomoxys calcitrans*, which will be of value to those seeking to fix the rôle this insect plays in the dissemination of disease, notably of infantile paralysis.

A circular of the Department of Agriculture contains the instructions to importers of trees, plants, and other nursery stock into Canada; it explains clearly and simply what the importer has to do, and reprints the text of the Act. Another circular deals with the control of locusts in eastern Canada; the author, A. Gibson, uses the term locust for grasshopper, whereas

it is better restricted to the migratory grasshoppers; but the circular is for popular use, and the term is probably so used in eastern Canada.

The most interesting point is the value of adding lemon juice to the poisoned bait for killing the insects; the method originated in Kansas, and works well in Canada.

In Bulletin No. 9 Mr. Gibson deals with the Army worm *Cirphis unipuncta*, an insect which caused a loss of 50,000l. in Ontario alone. He emphasises the great importance of co-operation among farmers in dealing with outbreaks promptly and thoroughly by means of trenching, poisoning, and rolling. It is possible that something better could be done with moth trapping on the "Andres Maire" system, which has proved successful elsewhere. The bulletin is a thoroughly practical, useful piece of work, and the Department evidently has the confidence of the farming community in Canada. H. M. L.

#### THE SUPPLY OF OPTICAL GLASS.

THE subject of the supply of optical glass and the needs and opportunities offered to the optical trade, by war and after-war conditions, still continues to attract the attention which it deserves. On July 16 an important conference was held at the London Chamber of Commerce between the Court and representatives of the Spectacle Makers' Company and representatives of the chamber and of the trade. The conference was convened by the company, and the chair was taken by the master, Sir J. F. L. Rolleston, M.P. There were also present Lord Southwark, president of the Chamber of Commerce, Viscount Hill, Sir William Hart Dyke, Sir Marcus Samuel, Dr. R. M. Walmsley, and others. The chairman opened the proceedings, and in the course of his speech explained how the debate in the House of Commons on optical matters which was initiated by Sir Philip Magnus on May 19, and in which several well-informed members, including the chairman, were prepared to take part, was interrupted and practically closed by the Prime Minister's very important announcement on "Coalition Government." He also referred to various matters to which we have directed the attention of our readers as they arose.

Lord Southwark, in opening the discussion, referred to the fact that he was not only the president of the chamber, but also a past-master of the Skinners' Company, which is so closely associated with the Northampton Polytechnic Institute and its work. He emphasised the importance of concerted action and the help which the City companies could give, and referred also to the valuable assistance which could be rendered by the chamber. In the discussion which followed, it was understood that the remarks made by trade members should not be reported. Dr. Walmsley, who was called upon to speak early in the debate, explained the points referred to in his letter to the *Times* of April 28, and indicated the importance of the opportunities which have now arisen for the recapture of those branches of the optical instrument trade which were so heavily handicapped before the war. He pointed out that this was worthy of a very earnest effort, and he referred particularly to the value of the trade in the employment of highly skilled labour, which forms so important an item in the production of complicated optical instruments, such as microscopes, etc. He also dwelt upon the necessity for training designers and computers. The importance of the spectacle-making branch of the trade was fully insisted upon, and eventually it was decided, on the motion of Lord