process—the promotion of restorative processes within the tissue. This view is directly opposed to the prevailing theories of sleep; Pavlov, from his interesting address on the part played by inhibition in the normal activity of the brain, thinks that sleep is the result of the spread of inhibition throughout the entire cortex and subcortical centres, and that the spread may originate from any point whatsoever.

The further chemical study of glutathione, a cellular constituent discovered by Hopkins and found to be of enormous importance in the oxidative mechanisms of living and actively growing tissues, has proceeded in several directions. Kendall, starting with a couple of tons of baker's yeast, has devised methods for increasing the yield and for estimating the glutathione by oxidation of the SH group with potassium ferricyanide; mention was also made that glutathione is a tri-peptid containing not only cysteine and glutamic acid, but glycine as well. [See, however, the letter from Sir F. Gowland Hopkins in NATURE of Sept. 21, p. 445.]

Progress was recorded in the extraction and purification of some of the hormones. Doisy has extracted from the urine of pregnant women by means either of chloroform or olive oil a product which on purification yielded a potent crystalline folliculin indistinguishable from that obtainable from follicular fluid; a paradoxical situation thus arises from the appearance of so large an amount of the oestrous hormone in the blood and urine during pregnancy, in view of the reports of abortion produced by injections of this hormone. Voronoff and his co-workers showed sections and photographs of parts of grafts of testes removed from animal and man; they describe a preliminary disorganisation followed by a re-organisation into two zones of which the peripheral zone is well vascularised and has seminiferous ducts possessing active epithelial cells.

Zavadovsky, in his investigations on the effects of hormones on the plumages of birds, found that activation or depression of pigment formation in brown leghorns by thyroid gland depended on the dose, depigmentation following large doses. He also came to the conclusion that the redistribution of the pigment in the feather of leghorns is to be regarded as a specific effect of interference of antagonistic influences of the thyroid hormone on one hand, and the feminine sex hormone on the other; his report was illustrated by dia-positives and skins of experimental animals.

Williams, McGlone, and Bazett produced evidence for the identity of certain specific receptors with definite nerve end-organs in the prepuc of man by a comparison of the distribution of cold and warm spots with histological preparations by noting the depths and making a count.

On the conclusion of the Boston Congress, the remaining foreign delegates, numbering now 750, were conveyed by motor buses via Plymouth to the Marine Biological Station at Wood's Hole on Long Island Sound. Demonstrations were arranged and many opportunities were given for observing the micro-technique developed by Chambers and his co-workers for physiological study of the contents of a single cell.

Methods of collecting material were shown to small parties on short expeditions in the laboratory's yachts. The day was brought to a delightful close with the local festive event of a 'clam-bake'. These shellfish, most closely approached by our mussel, are dug out of the sand and baked with sweet potato or other vegetable on the sand.

The party reached New Haven next morning by steamer, where they had an opportunity of visiting Yale University; they were welcomed by Prof. Yandell Henderson, who showed them, amongst other things, radiograms illustrating the production of atelectasis and of pneumonia in animals and its relief in these cases as well as in man, by the administration of carbon dioxide.

The foreign delegates were entertained at New York by Columbia University during their second week; the programme included visits to the new Medical Centre, the Rockefeller Institute, and to the Marine Biological Station on Long Island, when a visit to Prof. Graham Lusk's country house was included. It may be mentioned that, under pressure from his friends and colleagues, Lusk has just issued a revised edition of his excellent treatise on nutrition.

The party divided into two main groups, the first 150 being invited to Toronto, and the second, numbering 60, to Rochester (N.Y.), while the remainder left for their homes or for the Psychological Congress. Those who visited Rochester were given an account and demonstration of the new colour process in cinematography by research workers from the Kodak Works; it is the munificence of the Eastman family which is the main support of medical research in Rochester. The colour process is based on a purely optical device: the coloured field is projected, after first passing through a glass colour filter with three parallel bands of blue, red, and green, on to a special film having corrugations in the celluloid parallel to the coloured strips in the filter; these corrugations act as fine astigmatic lenses which project three separate line pictures on the sensitive film. The film is developed in a special manner so as to give a positive picture—really three superimposed positive pictures. By projecting this film with a similar parallel placed glass filter, the image on the screen appears in colour, which, as judged from examples like a pond of water-lilies and goldfish, seems perfectly natural.

The party entertained at Toronto were shown the laboratories, including those where insulin was finally isolated and tested, as well as the annual Toronto Exhibition, the greatest of its kind in the new hemisphere. The parties met again at Montreal, where McGill University was found to be as active in hospitality as in medical research.

The smaller party left a day earlier to visit Quebec, where they were the guests of the French Canadian University. In both these towns the physiologists were accorded a welcome by the civic authorities and by the Government of the Province of Quebec.

About 200 members set sail from Montreal and Quebec on the s.s. *Doric*, having made new friendships and associations, and looking forward with pleasurable anticipation to a re-union three years hence.

The Froghopper Problem in Trinidad.

THE sugar-cane frog hopper, *Monecphora (Tomaspsis) saccharina* Dist., is a serious enemy of the cane growers of Trinidad, and although there are records dating back to 1862, which may possibly refer to this insect, no severe outbreak occurred until 1906. Heavy intermittent attacks have followed ever since, the most disastrous year in this respect being 1917, when

about 10,000 tons of sugar were lost through frog-hopper damage. From 1909 onwards investigations into frog hopper eradication were conducted mainly by officers of the Trinidad Board of Agriculture and by certain specialists. Up to the end of 1917 this work was purely of an entomological character, but the studies of Williams and of Nowell showed the need of

approaching the problem on a wider basis. In 1924 a Committee was constituted to inquire further into, and to report upon, the frog hopper pest with the view of its control and ultimate eradication. Among other proposals it led in October 1925 to the Governor appointing a Frog hopper Investigation General Committee, and the deliberations of this body are published in the form of *Minutes* and *Proceedings* at frequent intervals.¹ The first meeting of this Committee was held in November 1925, and three sub-committees were appointed to deal respectively with (1) agricultural relations; (2) entomological relations; and (3) soil relations. Their personnel included planters, officers of the Department of Agriculture, and members of the staff of the Imperial College of Agriculture. The reports of these sub-committees are considered by a scientific committee which submits recommendations thereon to the general investigation committee alluded to above.

Among the more interesting features recorded or discussed in these *Proceedings*, it appears that the eggs of the frog hopper hatch freely only when the humidity of the atmosphere is greater than 90 per cent of saturation. Some eggs, however, exhibit delayed hatching even though the moisture conditions are entirely favourable, a fact of considerable practical importance, and the cause of these delayed hatchings is now being investigated. No reliable method of egg-destruction has been discovered, but the practice of bare-fallowing well-ploughed land is suggested as a possible measure in that it exposes the eggs to the effects of the sun. The destruction of the nymphs by means of dusting with the proprietary agent 'Cyanogas' appears to offer considerable promise as a practicable and economic method of eradication, but no insecticidal treatment for destroying the adult insects has yet been found. The use of light traps is not considered to have been adequately explored, and, in view of some success having been obtained on certain estates, improved forms of traps are to be tested. The only other entomological measure of importance is that of biological control, and it has been decided to prosecute a vigorous campaign in the near future in order to develop this phase of the work, and with special reference to the study of egg-parasites and predators in the field.

Perhaps one of the most valuable results coming from the frog hopper investigation has been its beneficial effect on general agricultural practice. Once it became to be realised that the subject is by no means

exclusively entomological, increasing attention has been given to soil conditions and to the factors governing the growth of the crop in general. The fact that a fairly definite correlation exists between susceptibility of canes (especially ratoons) to frog hopper attack and degree of soil acidity, has proved a great stimulus to further investigation in this direction. It has been found that (1) a positive correlation exists between the degree of saturation of the soil with lime and cane susceptibility; (2) soils of blight-free areas are absorptively saturated by lime, or nearly so; (3) soils of regularly blighted areas are less than 60 per cent saturated; (4) there is no correlation between gross soil content of lime and susceptibility; and (5) toxic aluminium in the soil often begins to appear when the degree of saturation falls below 60 per cent, and this may greatly increase the susceptibility to blighting.

There seems little doubt that the soils of the regions liable to frog hopper attacks are lacking in combined lime (exchangeable calcium), and are therefore usually acidic in reaction. The reason why canes growing on such soils are so liable, whilst canes growing on lime-satisfied soils are resistant, to blighting, has not so far been discovered.

The subject of water relations between the soil and crop has received considerable attention. Field observations periodically recorded at three representative stations, for special 'good' and 'bad' plots, have demonstrated profound differences in soil moisture conditions. These differences are reflected in the fluctuations in the moisture-content of the leaves of canes growing on these plots and in the greater transpiration rate for bad-plot canes, leading to more rapid drying out at the time of day when the frog hoppers feed. On the biochemical side it appears that the leaves of 'good' canes are much better manufacturers of sugars and proteins than 'bad' cane leaves, and that their moisture-content is less liable to fluctuation.

Many other problems of plant physiology are touched upon or discussed, and it is evident that much more experimentation, both of the laboratory and field type, is needed if the numerous suggestive indications and facts disclosed in these *Proceedings* are to be pursued to their practical issue. What is needed is a thorough fundamental ecological study of the cane-plant in relation to its full vigour and to its susceptibility to frog hopper attack. It is evident from these reports that these aspects of the subject are fully appreciated, and that due attention to soil conditions and plant growth are more likely ultimately to prove of lasting value to the growers than the application of entomological methods only.

A. D. IMMS.

Annual Conference of the Institut International de Bibliographie.

THE ninth Conference of the Institut International de Bibliographie was held, by kind permission of the governors and Prof. H. L. Callender, in the Imperial College of Science and Technology on Sept. 16 and 17. It was attended by representatives from many of the more important countries of Europe, including the following delegates: Prof. A. F. C. Pollard (President), Mr. Nemec (Czechoslovakia), M. Charles Sustrac (France), Dr. Hesse (Germany), Dr. S. C. Bradford (Great Britain), Mr. Andrau (Holland), Mr. Janički (Switzerland), and the General Secretaries, M. Henri La Fontaine (Belgium) and Mr. F. Donker Duyvis (Holland).

Monday was occupied with meetings of the Council and of the Commission of the Classification. Dr. Bradford gave a report on the discussions on classification during the recent congress of librarians in Italy.

He outlined a scheme whereby, by the general adoption by bibliographical agencies of a standard classification, a comprehensive subject-index to published information of all kinds could be realised at once, with the saving of untold amounts of useless effort now wasted in repetition of previous work. It appeared that no other classification than the Decimal Classification, elaborated during more than thirty years by the collaborators of the Brussels Institute, came into discussion, and this classification is now being adopted as a standard by institutions of all kinds throughout the world.

Mr. Donker Duyvis, as secretary of the Commission of the Decimal Classification, gave his report on the present state of the printing of the new manual of the classification. About 1500 pages have now been printed, which brings the manual to the end of the