

research on the theory of grinding or on the efficiency of commercial dust filters cannot progress without a knowledge of the size analysis of the materials concerned; and fundamental research on these and many other subjects is impossible until consistent and rapid methods of size analysis have been developed.

This conference was the first of a public nature to be held in Great Britain to consider the properties of powdered materials, and marks an important advance in the study of this branch of applied science. The complete set of papers and the ensuing discussion, both at the meeting and in writing, should become a valuable source of reference on the subject for many years.

HAROLD HEYWOOD

SOCIETY FOR EXPERIMENTAL BIOLOGY CONFERENCE IN UTRECHT

AT the suggestion of Prof. G. J. van Oordt, the Society for Experimental Biology was invited by the botanists and zoologists of the University of Utrecht to hold a conference there during April 11-14. This was a memorable event in the history of the Society, being the first occasion on which a meeting had been held outside Great Britain. Utrecht and its ancient University have been for long associated with the struggle for the freedom of thought in Europe, and, after the recent relief from a period of intellectual suppression, it was a peculiarly happy environment for scientific discussion.

The response to the invitation was much greater than was expected, and the conference was attended by more than eighty members of the Society and about forty biologists from Holland, as well as a few from Belgium. As usual, there were separate botanical and zoological sessions, one in the Botanical Laboratory which, with the adjacent Botanical Gardens, is directed by Prof. V. J. Koningsberger, the other in the Zoological Laboratory, the two main sections of which, devoted to experimental embryology and to endocrinology, are under the direction of Prof. C. P. Raven and Prof. G. J. van Oordt respectively.

Some fifty-five papers were read which covered a wide field, though many centred around subjects upon which active research is now in progress in Holland—phytohormones, absorption of substances by plants, growth and differentiation of animal tissues, and comparative physiology. During a discussion on the possible influence of phytohormones on the fine molecular structure of the plasma membrane, we learnt that the deficiencies in Holland's war-time diet had prevented the secretion into the urine of auxin-*a*, for which the botanists at Utrecht had therefore been compelled to substitute indolyl acetic acid in their experiments on plant growth. Among other interesting subjects discussed in the Botanical Section were the absorption and transport of ions and the influence on this of illumination, the structure of the cell wall, apogamy in ferns and a quantum interpretation of certain data on phototropism. The Zoological Section devoted a morning to tissue differentiation, beginning with the development of bone and widening out into a general discussion on cellular differentiation. Another set of papers on neurophysiology, mostly of vertebrates, but including one on sea anemones, also provided material for good discussion. The rest of the papers were not

so closely interrelated, but it was generally agreed that the meetings were stimulating and led afterwards to much informal discussion of these and other subjects of mutual interest to Dutch and British biologists. All communications were read in English and, to our great admiration, the proceedings were in no way hampered by the fact that our hosts were speaking a language in which they have had little practice in recent years.

During the afternoon of April 12, four of the University's Institutes showed demonstrations illustrating their current research. In the Botanical Institute were demonstrations of microdissection, of micro-chemical methods and of hormone test technique. In the Physical Laboratory (director, Prof. J. W. M. Milatz) is a biophysical research group working chiefly on problems connected with micro-organisms and photosynthesis, and here we were also privileged to see one of the few surviving original van Leeuwenhoek microscopes in an interesting demonstration of the history of microscopy. Work on experimental embryology and endocrinology was shown in the Zoological Laboratory; and in the Institute of Comparative Physiology, built in 1936 for the late Prof. Jordan with the aid of the Rockefeller Foundation, the research illustrated was mainly concerned with digestion and with the physiology of invertebrate muscle. This was the only occasion on which members of the Society experienced anything approaching disappointment as, owing to the excellence, number and geographical dispersion of the demonstrations, many were unable to see as much as they would have liked, though this was unavoidable.

The general organisation of the Conference and of its subsidiary functions was excellent, and for this we have to thank the local secretary, Mr. J. C. van de Kamer. In the evening of April 11 the delegates were received in the Central Museum by Dr. G. A. W. ter Pelkwijk, Lord Mayor of Utrecht and curator of the University, and by the director of the Museum, Jonkvr. Dr. C. H. de Jonge; and on the following evening there was a reception in the University by the president-curator, Jhr. Dr. L. H. Bosch Ridder van Rosenthal, followed by a chamber music concert by "The Society for Old Music" of works by Purcell and de Fesch. On Sunday, April 13, we were the guests of the Dutch Government in an excursion through North Holland to the Zuider Zee Dyke, and one of the chief engineers, Jr. Volker, and Mr. Botermans from the Governmental Department of Information, kindly acted as guides and explained some of the hydrological and biological problems connected with land reclamation.

By the generous invitation of one of the students' committees of the University of Utrecht, members of the conference were permitted to use as meeting-places and restaurants one of the clubs of the Utrechtsch Studentencorps, and a club of the Utrechtsch Vrouwelyke Studenten Vereeniging. This not only added greatly to the comfort and enjoyment of the proceedings, but also enabled us to understand how the Dutch have successfully solved the problem of a traditional corporate life in a non-residential university. But it must be especially emphasized that nearly all the eighty members of the conference were lodged and entertained in the homes of the University staff and of other professional people in the neighbourhood. In the present very difficult circumstances this is hospitality indeed; and one of the most significant features of the conference was the open-hearted demonstration of personal and informal

friendship which made the occasion one of much more than purely scientific value. This kind of atmosphere is perhaps less easily created at an ordinary international conference, and we hope that this will not be the last occasion on which a scientific society is invited to hold a meeting in another country.

L. C. BEADLE

MOUNT HOPE AND ITS DAIRY CATTLE

THE increase of milk production is one of the desiderata that is commonly accepted as necessary, and one of the equally commonly accepted ways of securing an increase is by the use of a proven sire. This is the more necessary because it has been said by no less an authority than Robert Boutflour that the average production during a lactation is little, if any, more to-day than it has been for a very long time.

It is to this end that the Mount Hope Farm was established, and a complex of investigations into the laws of inheritance among mice, poultry and dairy cattle began. Mr. Parmalee Prentice has now described these investigations (*Agric. History*, Oct. 1946). The work with dairy cattle started in 1916 when the first were bought, but contagious abortion delayed the start of real work on breeding until the herd had been purged of this disease, by which time (1924) a young Guernsey herd had been acquired which was thought likely to be good. For various causes a satisfactory bull did not appear, and in 1925 a bull was bought because he ranked well according to the system of valuing dairy bulls developed at the Maine Agricultural Experiment Station. This system is based on a comparison of a bull's mates and of his daughters; if the daughters' milk yield was higher the bull was advantageous, if lower the bull was detrimental. The amount of the increase was considered to be a measure of the bull's influence on milk yield.

Misfortune followed the choice, for the bull became impotent and a new bull was selected on the Turner measure for proven sires; but this was found unsatisfactory, and this particular system is no longer used "because it has been found that it over-estimated the inheritance which the sire contributed to its offspring"; and Mr. Parmalee Prentice and his co-workers found it conceivable that the daughters of this bull were good "not only because his influence was good but also because their dams had contributed as much as the sire"—which seems not unreasonable.

They then proceeded to work out a system of their own which they named the Mount Hope 'index', "a correct method of determining a bull's breeding worth from his daughters' records after allowance is made for the dam's influence upon the daughters' productivity". The index was first announced in 1927 and has now been before the world for twenty years. "Bull indexes are computed by comparing the production records of the daughters and mates of the bull. In order to compare the production of the daughters with the production of their dams and to make comparisons between other cows of different ages, our statistics of milk production since 1936 . . . are always in terms of the mature equivalent. The index is then always applied to a comparatively small number of dam-daughter pairs. Moreover seasons vary; food and management are different

in different barns and frequently change in the same barn. The physical condition of the cattle varies, and the result of it all is that though we are able with assurance to tell a good cow from a poor one and in general to tell how good a particular cow is, we are never able in measuring production records to tell with scientific precision the productive ability of a particular cow."

In many places the Mount Hope index has been accepted and is being used. In others, and perhaps the majority, the index is regarded with some scepticism. The need for proven sires and the sons of proven sires in dairy cattle breeding is fairly generally accepted, and records have been adopted so that performance may rank alongside 'pedigree'—one of the qualifications of which the Mount Hope workers are most critical. There has been a good deal of controversy about the Mount Hope dairy cattle and the Mount Hope index, and the essay by Mr. Parmalee Prentice in *Agricultural History* of October 1946 tells the whole story of the work that has been done there. The quarterly is the organ of the American Agricultural History Society, the offices of which are at Room 3870, South Agricultural Building, Washington 25, D.C.; and the annual subscription is four dollars.

G. E. FUSSELL

RELEASE OF INFORMATION ON ATOMIC ENERGY*

THE National Research Council of Canada is making available a number of reports, recently taken off the secret list, on subjects in the fields of theoretical physics and applied mathematics. These reports, which are either too long for journals or are summaries of other work, will be reproduced by the multilith process and will be available at a small charge from the Plans and Publications Section of the National Research Council, Ottawa.

Much material in the hands of the Council is being published in Canadian scientific journals, but the titles mentioned below represent a few which for special reasons cannot be dealt with in that way.

LIST OF DECLASSIFIED REPORTS

MT-1	The Functions $E_n(x) = \int_1^{\infty} e^{-xw} w^n dx$	G. Placzek
MT-12	Elementary Approximation in the Theory of Neutron Diffusion	P. R. Wallace and J. LeCaine
MT-4	Notes on Diffusion of Neutrons without Change in Energy	G. Placzek and G. Volkoff
MT-131	A Table of Integrals Involving $E_n(x) = \int_1^{\infty} e^{-xw} w^n du$	J. LeCaine
MT-88	Influence of a Small Black Sphere upon the Neutron Density in an Infinite Non-Capturing Medium	B. Davison
MT-232	Influence of an Air Gap surrounding a Small Black Sphere upon the Linear Extrapolation Length of the Neutron Density in the Surrounding Medium	B. Davison
MT-93	Influence of a Large Black Sphere upon the Neutron Density in an Infinite Non-Capturing Medium	B. Davison
MT-112	Angular Distribution due to an Isotropic Point Source and Spherically Symmetrical Eigen-Solutions of the Transport Equation	B. Davison
MT-135	Influence of a Large Black Cylinder upon the Neutron Density in an Infinite Non-Capturing Medium	B. Davison
MT-124	Large Spherical Hole in a Slightly Capturing Medium	B. Davison
MT-136	Neutron Density at the Centre of a Small Spherical Cavity	B. Davison

* British declassified reports are announced in *Nature*, March 22, p. 411.