measures of conservation is of the highest importance for the continued prosperity of this species.

Investigations in other countries will be assisted by the National Sections of the International Committee for Bird Preservation. The British Section, through the Wildfowl Inquiry Committee, with its joint organisation for observing wildfowl, will investigate the migration of sheld-ducks with the view of locating other places of arrival and departure and other regular routes of migration across the British Isles.

A detailed account of the summer migration of the sheld-duck as observed by me in Morecambe Bay over a period of years will be published in *The Ibis* in 1950, and will include particulars of the assembly of the migrants, the times of departure, the number of ducks in each flock, the line of flight, weather conditions, the departure-behaviour of the migrants, etc.

[1] Hoogerheide, J., and Kraak, W. K., *Ardea*, **31**, 12 (1942).
[2] Goethe, F., "Die Vogelinsel Mellum", *Abh. Geb. Vogelk.*, Berlin, **4** (1940)

SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

ANNUAL REPORT FOR 1947–48

THE third annual report of the South African Council for Scientific and Industrial Research, covering the year ended October 5, 1948*, records considerable development in the staff and facilities of its laboratories and associated service departments; the Industrial Research Associations for the Leather and Footwear and Fish Industries became corporate bodies under the Companies Act during 1948 and had a very successful year. The Paint and Sugar Milling Research Associations were expected to begin operations very shortly. The Research Committee of the Federated Chamber of Industries provides a valuable link between industry and the Council and has undertaken an inquiry into the present and future demand for various types of research workers in South African industry. The Medical Research Committee was reconstituted during the year and has formulated detailed plans for developing a medical information service and for the development of small research units and teams specially qualified to attack specific research problems of preventive and curative medicine. The units will be established at various universities or in association with the Department of Health or the South African Institute for Medical Research. It was hoped to start in 1949 with units in applied physiology, social medicine, virus diseases, tuberculosis, amœbiasis, bilharzia and cardio-pulmonary disease.

These units will in the main be an extension of university research activities, but the Council's scheme for supporting research at universities has also functioned satisfactorily, while a Committee formed by the Council, in association with the Council for Social Research, has formulated proposals for the establishment at the universities of a number of permanent posts to provide for research and advanced teaching in subjects where the facilities and history of the department concerned promise success. These proposals were being considered by the Minister of Education. The Nuffield Foundation asked the Council to act as a channel for the nomination by South African universities of distinguished men of science to visit the country for discussions with university and other research workers and thus to stimulate research development. The Council has also been concerned with the manning of the conference recently held in Johannesburg to discuss collaboration in long-range research on specialized problems in Africa south of the Sahai a. The Council also arranged, in co-operation with the Union Meteorological Division, the South African Air Force, and its own National Telecommunications and Physical Laboratories, for very successful triall on the possibilities of the artificial stimulation of rain with dry ice

The National Building Research Institute continued to expand and, with the sub-division of the original Engineering Division into three divisions, is now organised in five divisions, besides an administrative section. In the new Engineering Division work is in progress on the physical properties of the various elements of buildings and the cost of buildings; in the Soil Mechanics Division on the development of a rational theory for small-house foundation design and of a satisfactory soil pressure cell; and in the Functional Efficiency Division on the development of tests for thermal properties of building materials, the determination of heat transmission through the various elements of buildings, ventilation conditions, lighting and the acoustical properties of building materials and tests for assessing their resistance to rain. The Materials Division has reviewed the use of exfoliated vermiculite in building and has studied expansive mortar failures in brickwork, termite damage in South Africa and the protection of building timbers, the improvement of Portland cement and the determination of the efficiency of water-proofing agents. The Architectural Division has studied all forms of housing development and minimum standards of accommodation in framing housing policy, and two sociologists have been working in connexion with the latter project.

In the National Chemical Research Laboratory studies of South African clays of industrial importance by modern techniques are under way. Apparatus for routine measurement of the surface area of paint pigments and for the measurement of surface areas by gas absorption has been constructed, and the chemistry of chromium and the citric acid fermentation of cane molasses have both received attention. Lack of chemicals hindered the development of the Organic Chemistry Division; but preliminary studies of wool wax have been concerned with the elaboration of analytical methods, and the general outlines of the structure of a phenolic component of the timber of *Chlorophora excelsa* have been determined. The Nutrition Unit has widened the scope of its activities and completed investigations on the absorption of fat and on the digestibility of crude fibre during the consumption of diets rich in whole grain and white breads.

Further experience of personnel research in industry by the National Institute for Personnel Research has led to the conclusion that such research is rather costly and that it is preferable to carry out investigations for individual firms rather than for representative bodies. Aptitude tests can only profitably be undertaken in the following circumstances: when

* South African Council for Scientific and Industrial Research. Third Annual Report, 1947–1948. Pp. ix+90. (Pretoria: South African Council for Scientific and Industrial Research, 1949.)

candidates are being selected for a well-organised training scheme, from which the necessary criteria for test validation can be obtained; when the operational situation permits the introduction of classification tests; when the production problem can be solved by aptitude tests; and when facilities are or can be made available for the routine application of such tests. Personnel research deals with people, and for most purposes these people must be subjected to experiment. Laboratory investigation into certain problems encountered in field research projects has become urgent. Current research projects include personnel selection and classification for the Defence Forces; a study of the factors determining fatigue and output among operatives in the clothing industry; the construction of selection and classification tests for operatives in the clothing industry; and standardization of the Wechsler–Bellevue intelligence and achievement test for ex-volunteers in shelter employment, as well as some statistical projects.

In the National Physical Laboratory instruments have been developed for logging temperature and radioactivity in boreholes under South African conditions and for determining very low concentrations of radioactive substances; and a method has been developed for rapidly determining the elastic properties of wool and other textile fibres, under dynamic conditions involving no permanent set. Biological work was undertaken with phosphorus-32 as well as experiments on the action of hydrogen peroxide on bacteriophage, and an extensive survey of particle-size determination was made with the Geiger counter X-ray spectrometer installed in March 1948. A gravimetric survey of South Africa was in progress, and a seismic prospecting unit has been redesigned and modified. The Telecommunications Research Laboratory continued its work on the ionosphere and its effect on high-frequency radio communication, radio noise-levels, radar weather observations and the design of an automatic weather station.

The account of the work of each Institute or Department includes a list of publications by members of the staff during the year. Lists of publications by holders of research grants during 1946–48 are appended to the report, together with the regulations governing the award of research bursaries and grants and lists of research awards made in 1946–48.

FIFTY YEARS OF GENETICS

THE Genetical Society of Great Britain held its hundredth meeting in Cambridge during June 29–July 1. It was also the thirtieth anniversary of the Society, founded by William Bateson in 1919, and the meeting was intended to be one with time and, possibly, atmosphere for taking stock of the past and looking at the future. This aim was substantially attained. There were three addresses at the opening session, by Profs. Punnett, Sonneborn and Nachtsheim. The remainder of the meeting consisted of a small number of papers on work in progress at the Department of Genetics, Cambridge, and of a comprehensive demonstration, including visits to various Cambridge laboratories, of genetical research in Great Britain. A number of geneticists from abroad attended the meeting and most of the genetical societies of other countries were represented.

In his address on "The Early Days of Genetics", Prof. R. C. Punnett gave a vivid account of the crucial period between 1900 and 1906 which witnessed the rediscovery of Mendel's laws and the discoveries of linkage and the chromosomal basis of sex determination. Prof. Punnett's recollections were those of one who played a fundamental part in these developments; they constitute an indispensable record of the early history of genetics as seen by a member of one of the most active teams of those times. Fortunately, the full text will be published soon. Prof. Punnett described anecdotically the violent controversy between Bateson, who championed Mendelism and emphasized the role of discontinuous hereditary variation in evolution, and the biometricians, led by Pearson, who stood for continuous variation. By 1910, Mendelism and discontinuous variation had conquered. In retrospect, however, even in the vivid picture given by Prof. Punnett, this controversy and its outcome seem almost unreal. By 1930 the works of Fisher, Haldane and Sewall Wright had shown that the alternatives on which the battle had been fought were false ones, discontinuity in the cellular basis of heredity being compatible with continuous hereditary variation. The extraordinary development of Neo-Darwinism which followed has led geneticists, systematists and palæontologists to talk almost the same language.

If Prof. Punnett's paper showed how modern genetics is linked to the ideas and the remarkable experiments of the early Mendelian times, the address which followed on the "Role of the Cytoplasm in Heredity", by Prof. T. M. Sonneborn, of the University of Indiana, left no doubt that these developments have led far and have opened wider new vistas.

Prof. Sonneborn dealt with what have been called "cytoplasmic units endowed with genetical continuity". After summarizing the implications of his own work, now classic, on the inheritance of the 'killer' character and of antigenes in *Paramecium*, he dealt with the inheritance of plastids in plants, of certain structures, like the parabasal body of trypanosomes in Protozoa, with viruses, etc. The picture arising from all these once unconnected fields is that of non-nuclear self-reproducing units—normal constituents of the cells or parasitic—which have, in common with the genes, the properties of mutation and reproduction. Some of these structures have been shown to be dependent on a specific genetic constitution of the 'host' cell in order to be able to reproduce or mutate: so far, however, no conclusive evidence has been put forward of the existence of cytoplasmic units, which, besides being dependent on the genes of the 'host' cell for their reproduction, are actually initiated by the genes. Prof. Sonneborn warned the embryologists that such evidence is necessary before further speculation on the role of such purely hypothetical 'plasma-genes' in cell differentiation is permissible.

The third address in the opening session of the meeting was by Prof. Nachtsheim, of the University of Berlin, on "Comparative Investigations on Hereditary Blood Diseases in Man and Animals". This address dealt with one of the important trends in present genetics; namely, the use of mutants in the investigation of morphogenetic processes. In particular, Prof. Nachtsheim dealt with the Pelger anomaly (reduced segmentation of the leucocyte nuclei), which is shown by about one in a thousand