

## NATIONAL RESEARCH COUNCIL OF CANADA ANNUAL REPORT

THE thirtieth annual report of the National Research Council of Canada, 1946-47, includes the report of the president, Dr. C. J. Mackenzie, together with the financial statement for the year ended March 31, 1947 (Ottawa: National Research Council). Dr. Mackenzie's report gives a general conspectus of the work of the Council, but for scientific workers and others interested in details of the projects in progress, a more comprehensive booklet, "The National Research Council Review for 1946", is available on order from the Council. At the end of the War, a Defence Research Organisation was formed under the Department of National Defence, and is responsible for determining what research is to be done for military purposes during peace-time. The president of the Research Council is *ex officio* a member of this Board. Associate committees with purely war-time functions which had completed their assigned tasks have now been disbanded, but at the end of 1946 there were thirty-three active committees. Eighty-one research grants were made in 1946-47 directly by the Council, 82 through the Division of Medical Research and 93 through committees, while scholarships were awarded to 185 graduate students to enable them to extend their training in research.

Conversion of the Council's activities from war to peace was completed during the year, but the Council is at present recruiting the personnel required to bring its peace-time establishment to full strength. An Atomic Energy Research Division has been established at Chalk River to investigate the applications of atomic energy and the use of its products in industry and medicine. The Council took over on February 1, 1947, full responsibility for the administration and operation of atomic energy development at Chalk River, and will carry on these activities in accordance with broad general policies fixed from time to time by the Atomic Energy Control Board. A Division of Medical Research has been organised to stimulate and support investigations in this field, and has set up, at the request of the manufacturers, a committee to advise on the distribution of streptomycin and to make recommendations as to clinical conditions for which streptomycin might be used. A Building Research Division is being established, and work is progressing on the construction of a Prairie Regional Laboratory at Saskatoon for the promotion of studies on the better utilization of agricultural surpluses, notably wheat, and farm waste products such as straw. The newly established Division of Information Services has substantially expanded its survey of German and other reports for the solution of specific manufacturing problems.

An Electrical Engineering and Radio Branch has been created to co-ordinate and direct work in this field. The most important contribution in the development of radio aids to air and marine navigation during the year was a radar distance indicator, which enables an aircraft pilot to ascertain his distance from one or more pre-selected ground stations, its distance being read directly in miles on a simple meter. The Council is also co-operating in the development of radar equipment, by means of which it is hoped to determine base lines up to 300

miles long with an accuracy of 20 ft., and to permit spot fixes of photographic aircraft with an accuracy of 100 ft. in 200 miles. The laboratory is also engaged in developing a radio altimeter capable of providing a continuously recorded altitude measurement accurate within 50 ft. In the Division of Physics and Electrical Engineering, work has been undertaken to provide first-class facilities for scientific standardization, and a new project with a magnetic airborne detector is directed to the scientific determination from the air of the earth's magnetic elements and the location of mineral and oil deposits. Two experimental buildings of the radiant-heating project have been constructed, and work has been resumed on the thermostatic control of heated refrigerator cars. An infra-red detector was used successfully to ascertain whether joints were heating on transmission lines, and an apparatus has been completed by means of which the thermal conductivity of metals can be measured up to 800°.

A programme of photographic research is under way to determine the important factors in making positive prints on paper so that the maximum amount of information can be recovered from the negative, and a paper describing the final techniques developed for night photography is being published. Studies have been made of the factors affecting the dimensional stability of film under actual survey conditions, and further work has been done on the measurement of emulsion speed for aerial photography by a resolving power criterion, as well as on photometric standardization. Work in colorimetry has been initiated, and the Canadian Photographic Research Committee has been replaced by an Associate Committee on Photographic Research.

In the Division of Applied Biology one group is primarily concerned with fats and oils, and work on the processing and treatment of domestic oils for edible purposes has continued, particularly attempts to obtain an edible fraction from linseed oil and another fraction with superior properties for use in the paint industry. Work has continued on egg products, pork products and dairy products, particularly butter and dried milk. Preliminary trials of a Fritz butter-making machine from Germany indicated that the difficulties in meeting Canadian standards can be overcome. Efforts are being made to improve the versatility of chemical methods of assaying for riboflavin, thiamin and niacin. In the Ottawa laboratories, pilot plant studies on the production of 1,2:3-butylene glycol from wheat with *Aerobacillus polymyxa* were completed, and fermentation efficiencies of 90-100 per cent were consistently attained. A method has been developed for the manufacture of phthalate resin from 2:3-butylene glycol and phthalic anhydride which has outstanding physical properties and is of interest to paint manufacturers. Wheat syrup was investigated on a semi-pilot plant scale, and first-quality corn syrups were prepared from the starch separated.

The reorganisation of the Division of Chemistry into Fundamental Chemistry and Chemical Engineering was completed, and the organic section of the former branch has investigated synthetic rubber and the isolation of new alkaloids. Many studies of photosensitized reactions have been made, including investigations of free radical processes by the mirror technique. Studies in surface chemistry have included the effect of physical adsorption on the electrical conductivity of activated carbon rods; but the work of the inorganic section, like that of the chemical

engineering branch, has been concerned with the atomic energy project. The textile section has carried out further work on the rot-proofing of textiles, thermal insulation of protective clothing, the use of synthetic detergents, water-repellants and moth-proofing agents. The corrosion of steel by water is being studied under static and under flow conditions, including the mechanism of corrosion inhibitors. Preliminary data have been obtained on a new type of catalyst for the oxidation of ethylene to ethylene oxide, and an extensive research has been continued on the chemistry of long-chain unsaturated fatty acids. Further work on a new type of propeller de-icing, on the control of frost on standing aircraft, the development of an effective rain repellent for aircraft windows and of a catalyst for the oxidation of carbon monoxide to permit accurate determination of low concentrations in air, promise important peace-time applications. The relation between chemical structure and plasticizer reaction is being studied, while in the aeronautical laboratories the tailless glider was one of the major projects. The hydraulics laboratory completed tests on a model of a Great Lakes' harbour to determine the effect of a proposed pier extension upon sand-bar formation in the harbour entrance. Research on low-temperature lubricants has yielded much valuable information on flow characteristics of greases at low temperatures. Work on artificial limbs has continued in the structures laboratory, making use of processes developed during research on moulded aircraft components. Problems involved in 'panel', or radiant, heating are being investigated, and an important advance in low-cost housing was made in the development of a modular system for the construction of pre-fabricated houses.

## BRITISH ELECTRICAL AND ALLIED INDUSTRIES RESEARCH ASSOCIATION ANNUAL REPORT

THE work of the British Electrical and Allied Industries Research Association throughout the year ended on September 30, 1947, is recorded in the twenty-seventh annual report recently issued.

The field of activity of the Association is perhaps most readily appreciated from a block diagram given in the report, in which twenty-two main lines of research are represented, several of which divide into as many as ten distinct branches. These include extensive studies of insulating and magnetic materials and of gaseous discharge phenomena, in regard to which researches of both a fundamental and of an applied character are in progress. Surge phenomena, communication interference, earthing safety and circuit problems, overhead lines, power plant and rural electrification are also main subjects of investigation.

In the section on heating, cooking and allied problems, reference is made to work in progress on a heat pump installation and to the early publication of a final report on an experimental investigation of the thermal characteristics of a concrete floor heated by buried cables. In connexion with the work on surge phenomena it is reported that a recurrent surge oscillograph has been developed which employs a

sealed-off tube and gives a performance comparable with that obtained with the continuously evacuated type of instrument. Integrating electricity meters provide the subjects of several extensive investigations. A number of these is concerned with the behaviour of instrument jewels, the initiation of a new series of tests on tungsten/diamond and tungsten/sapphire bearings being reported. A detailed examination of the parasitic forces occurring in induction-type watt-hour meters has also been made.

It is interesting to note the wide range of researches supported by the Association in various university departments throughout Britain. These include investigations on the properties of high-pressure, high-temperature steam, work on the fundamental properties of magnetic materials and on the improvement of electrical sheet steels. Studies on the development of spark discharges include an investigation of the build-up of ionization by the Wilson cloud-chamber technique, and work on the high-frequency corona discharge. Experiments on the use of artificial illumination in horticulture are also being conducted in one university department.

In the introduction, the first paragraph deals with the reaction upon the Electrical Research Association of the transfer of the electrical supply industry in Britain to public ownership. The supply industry has provided some 30 per cent of the income of the Association, and the future relation of the British Electricity Authority with the Association is therefore of great importance. It is reported that the chairman of the Authority has confirmed the intention to support the Association and has provided for the safeguarding of the Association's finances during a transitional period in which the new basis will be worked out. The present report testifies to the existence within the electrical industry, both in the supply and the manufacturing spheres, of a spirit of co-operation in research which has built up, by good will and patient effort, a powerful instrument for the scientific and technical advancement of the industry as a whole. Such an achievement is a contribution, by no means inconsiderable, to the vital industrial needs of Great Britain at the present time.

J. G.

## Rh NOMENCLATURE

FOLLOWING the hearing of evidence from interested persons, W. B. Castle, M. W. Wintrobe and L. H. Snyder have reported<sup>1</sup> to the Surgeon-General of the U.S. Public Health Service on the nomenclature of the anti-*Rh* typing sera. The report traces the history of *Rh* nomenclature, summarizes the evidence for and against Wiener's and Fisher's nomenclature respectively, and recommends that the Wiener nomenclature shall appear first on the label of serum containers, followed by the Fisher terminology in parentheses, thus: "Anti-*Rh*<sub>0</sub> (Anti-D)".

The authors have, on the whole, presented a fair and accurate summary of the complex history of the development of *Rh* theory and nomenclature, and of the associated controversies. They have, however, not pointed out that Fisher's notation was put forward<sup>2</sup> a year or more before any discussion of the possible genetic situations. Fisher's essential contribution lies in his postulation of three pairs of antigens, the antigens of each pair separately behaving as though they were the products of a pair of allelomorphous genes. Neither the validity nor the great