

the grants in aid of research from the National Research Council, the Defence Research Board, and the provincial governments. These bodies keep aware of the support each is giving in various fields. McGill University has been famous for its physical research since Lord Rutherford occupied the Macdonald Chair of Physics and carried out there his early and revolutionary work on radioactivity. It was here, under Rutherford, that O. Hahn obtained his early training in radioactivity. Since Rutherford's time McGill has been well known in other fields. The work on the Stark effect should be noted. A cyclotron just completed will provide splendid opportunities for research in nuclear physics. A new electronics laboratory was recently established to carry out work in microwave physics.

MacLennan did for the University of Toronto what Rutherford did for McGill. While head of the physics department from 1907 to 1932 he established a large well equipped laboratory for spectroscopy and the first cryogenic laboratory on this continent. The research tradition is being well maintained by the present staff in these and other fields. Research at Toronto on electron microscopy is well known. For a little over a year the department has been headed by the outstanding geophysicist, E. C. Bullard, who started there a series of important geophysical investigations. Unfortunately, Canada is losing him at the end of this year when he goes to take up his appointment as director of the National Physical Laboratory in Great Britain.

On the west coast, the University of British Columbia is making a strong bid to become one of the best schools of graduate physics and research in Canada. Facilities for granting PhD's in physics were recently established under its large and distinguished faculty. Work has been commenced in nuclear physics, theoretical physics, spectroscopy, and several aspects of the solid state. A Van de Graaff generator will be shortly in operation.

At Queen's University a seventy Mev synchrotron is being installed. Excellent research facilities for nuclear physics will thereby be provided. The Queen's department of physics is also active in other fields of physics, particularly optics. The French-speaking universities of Montreal and Laval are attaching a high importance to research in physics. At the University of Montreal cosmic rays are being studied by photographic and cloud cham-

ber techniques. Electron diffraction by gases is being used for the determination of molecular structure. At Laval University beta ray spectroscopy and mass spectroscopy are receiving considerable attention.

There have long been interesting and important investigations on the properties of pleochroic haloes at Dalhousie, the oldest university in Canada, established at Halifax, Nova Scotia in 1789. This work is continuing. Nuclear induction experiments have been in progress for approximately two years. Researches are projected on the study of proton relaxation times in various molecular substances and the precision measurements of nuclear moments.

Microwave radiation is receiving much attention at the University of Western Ontario at London, Ontario. Work is being initiated in infrared and ultraviolet spectroscopy. The Medical School has a department of biophysics which is a subdepartment of physiology. First class opportunities are provided here for the application of modern physics to biological problems. McMaster University, at Hamilton, Ontario, has, in its physics and chemistry departments, important researches on mass spectrometry, beta ray spectroscopy, and microwave physics.

The provincial universities of Manitoba, Alberta, and Saskatchewan are all actively supporting physical research in various fields, particularly spectroscopy and nuclear physics. A twenty-five Mev betatron (the only one in Canada) has been installed at the University of Saskatchewan by funds provided from the Canadian Atomic Energy Control Board, the National Research Council, and the Cancer Institute of the Province of Saskatchewan. Fundamental as well as applied medical work is being carried out with this betatron. In addition studies of the upper atmosphere, the physical properties of snow, and specific heats of gases are being pursued in the physics department while the chemistry department is applying radioactive tracers to a variety of problems.

Industry

Before the war Canadian industry had very limited interest in physical research. This picture has now completely changed as a result of the great increase in industrialization to meet war requirements. No great powers of prophecy are needed to foresee that this trend is in-

*Chalk River plant.
The large building at
the left houses the pile.*

*National Film Board
of Canada*



creasing rapidly and will continue to do so for some time to come. Most of the large industries have gone heavily into physical research to develop new products and new techniques. The growing recognition of the commercial value of physics has opened up promising careers to those wishing to devote themselves to industrial research problems. The character of the work is varied. Emission spectroscopy for chemical analysis has seen something in the nature of a boom. All large companies concerned with the production of metals and chemical products are fully convinced of its usefulness. Radiographic practices in foundries are firmly established. Radar developments of all kinds are being sponsored in the research laboratories of the electrical industry. The importance of infrared absorption spectroscopy to the oil industry has been rapidly recognized. Commercial interest is shown in such things as the application of radar methods to the maintenance of control in air photography.

Many Canadian physicists are members of the American Physical Society and the other societies of the American Institute of Physics. Canada has its own Royal Society which is modelled on the Royal Society of London, except that it comprises men not only in the sciences but in the humanities. To this society many Canadian physicists belong. A considerable portion of its annual meeting is devoted to papers on physics. Since 1945 Canada has had its own Canadian Association of Physicists enjoying the support of almost all Canadian physicists. Symposia and meetings are arranged much in the style of the American Physical Society. A good deal of Canadian research in physics is reported in the journals of the American Institute of Physics. However, a Canadian physics journal is available to them in Section "A" of the Canadian Journal of Research. This is published bimonthly by the National Research Council. With the increasing amount of physical research in Canada this journal is rapidly increasing in stature. Canadian physicists hope that it will gradually establish itself as an important contributor to the whole field of physics. Occasionally contributions are published in the Transactions of the Royal Society of Canada, but this publication has a disadvantage of appearing only once a year.

In a brief article of this sort it is not possible to mention all the individual laboratories, all the different types of research that are underway, or even to attempt naming all those who have become distinguished in Canadian physics. In fact, such catalogues tend to be rather uninformative and dull unless more detail of the scope of the work is given than would be possible in a description of this sort. But we hope we have given at least an over-all impression of the diversity of the work, its vitality, and the seriousness of the financial support accorded it by government and private concerns. A great development has taken place already but there will be an even greater one during the next decade and it is a matter of satisfaction that the over-all organization of physics in Canada, both formal and informal, is of a character that can sustain efficiently a rapid expansion.

G. HERZBERG AND L. E. HOWLETT



CALENDAR

of EVENTS

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| December 4-7 | American Institute of Chemical Engineers (Annual Meeting), Pittsburgh, Pennsylvania |
| December 6 | Society for Applied Spectroscopy, New York City |
| December 7 | Physics Club of Philadelphia and Franklin Institute (Joint Meeting), Philadelphia, Pennsylvania |
| December 17 | Institute of Aeronautical Sciences Annual Wright Brothers Lecture, Washington, D. C. |
| December 26-31 | American Association for the Advancement of Science, New York City |
| December 27-30 | AAAS Science Teaching Societies, New York City |
| December 28-30 | Division of Fluid Dynamics, <i>American Physical Society</i> , University of Virginia |
| December 29-30 | <i>American Physical Society</i> , Stanford, California |
| December 30 | Mathematical Association of America, New York City |
| January 3-6 | American Meteorological Society (30th Anniversary Meeting), St. Louis, Missouri |
| January 10 | Society for Applied Spectroscopy, New York City |
| January 11-13 | National Society of Plastics Engineers, Cleveland, Ohio |
| January 23-26 | Institute of Aeronautical Sciences (Annual Meeting), New York City |
| January 31-February 1 | Division of Electron Physics of <i>American Physical Society</i> and the Panel on Electron Tubes of the Research and Development Board of the Department of Defense, New York City |
| February 2-4 | <i>American Association of Physics Teachers</i> , New York City |
| February 2-4 | <i>American Physical Society</i> (Winter Meeting), New York City |
| February 15-17 | Conference on Analytical Chemistry and Applied Spectroscopy (jointly sponsored by the American Chemical Society and the Spectrographic Society of Pittsburgh), Pittsburgh, Pennsylvania |
| February 27-March 3 | American Society for Testing Materials, Pittsburgh, Pennsylvania |
| March 16-18 | <i>American Physical Society</i> , Oak Ridge, Tennessee |
| March 17 | Physics Club of Philadelphia, Philadelphia, Pennsylvania |
| March 26-30 | American Chemical Society, Houston, Texas |
| April 9-13 | American Chemical Society, Philadelphia, Pennsylvania |
| April 16-20 | American Chemical Society, Detroit, Michigan |
| April 27-29 | <i>American Physical Society</i> , Washington, D. C. |
| May 28-31 | American Institute of Chemical Engineers, Swampscott, Massachusetts |
| June 21-24 | <i>American Physical Society</i> , Mexico City, Mexico |