The investigations carried out by the Defence Research Board involve a variety of scientific disciplines and fields. The research areas concerned include geophysics and the Arctic, electronics and telecommunications, medical and environmental protection, materials, aeronautics, civil defence, operational research and guided missiles. Studies and appraisals of equipment and weapons of the three Armed Services are maintained on a continuous basis with the view of developing new items and improving existing ones.

The Board's naval research activities are carried out at the Naval Research Establishment and the Pacific Naval Laboratory in Dartmouth, N.S., and Esquimalt, B.C., respectively. The weapons programme is concentrated at the Canadian Armament Research and Development Establishment at Valcartier, P.Q., and investigations in the methods of protection against animal diseases are carried out at a small establishment on Grosse Ile in the St. Lawrence River near Quebec City.

In Ottawa, the Defence Research Telecommunications Establishment and the Defence Research Chemical Laboratories are just beyond the eastern and western approaches to the city, respectively. Headquarters activities are carried out at National Defence Headquarters, where an Operational Research Group is also co-ordinated with the Defence Research Board Services programme in this new scientific field.

The Board's biological research programme is conducted at the Defence Research Kingston Laboratory in Kingston, Ont., and its medical activities at the Defence Research Medical Laboratories at Downsview, Ont. The latter establishment is concerned with investigating methods of using the Serviceman's physical capabilities to their fullest extent and with matching them to the complex machines he operates, rather than with curing the ill.

Activities at the Defence Research Northern Laboratory at Fort Churchill, Man., involve Arctic research. Until recently, emphasis was placed on developing techniques and methods of assisting troops to operate effectively under severe weather conditions. Cold-weather trials involving both men and equipment have been particularly important fields for study. The Laboratory now provides facilities for visiting scientists from Canada, the United Kingdom and the United States engaged in conducting northern investigations. During the next two years, the Laboratory will serve particularly as a scientific base for many of Canada's International Geophysical Year operations. Scientists of the Board will assist an American rocket team in launching a series of missiles with instrumented nose cones in support of upper atmospheric research.

At Suffield, Alta., near Medicine Hat, staff scientists conduct trials and experimental activities connected with the defensive aspects of biological, chemical and flame warfare. An important entomological programme, completed recently, resulted in the development of useful methods of controlling forest and crop pests by air-spray techniques. The station is ideally located on the prairies for trials and experiments, and its thousand square miles of rolling terrain provide unsurpassed physical facilities for such operations.

The Board has gained international recognition for some of its scientific activities, several of which promise useful civilian implications. Among these are anti-corrosion techniques to protect ships' hulls, a rocket-type anti-tank weapon with impressive accuracy, development of the detection unit installed in the Mid-Canada Early Warning Line, upper atmospheric research, development of ration and survival packs and dehydrated food techniques and an active role in promoting in Canada knowledge of guided missiles.

Recent changes in emphasis in the Board's scientific programme have involved an increasing interest in atomic activities, including the participation by members of its staff in last year's British–Australian atom bomb trials, an expanding use of electronic aids in many fields of defence science and in co-operation with the United Kingdom and the United States, a series of studies concerning certain phases of the defence against intercontinental ballistics missiles and, particularly, methods of countering attacks by such weapons.

The work achieved by scientists of the Defence Research Board during the past ten years provides them to-day with the confidence necessary for their second decade of operations.

OBITUARY

Mr. Atholl Blair, C.B.E.

Mr. Atholl Blair died suddenly at his home in Belfast last month at the age of seventy-one. He had spent a lifetime in the service of Messrs. Harland and Wolff, and was probably the world's leading builder of all forms of marine propelling machinery. When he retired in 1953 from the firm with which he had served his apprenticeship as an articled pupil he occupied the position of engine works manager and was a director of the firm. His services were retained as a consultant, however, and he remained a most active man until his sudden death.

Atholl Blair was the son of the late Sir Robert Blair, a distinguished educational administrator who occupied the position of chief education officer to the London County Council. Before succeeding to that appointment Sir Robert had gone to Ireland at the turn of the century to set up the system of technical education in that country, and his son Atholl, after going to school in Edinburgh and Dublin, attended the City and Guilds Engineering College, where he studied under the late Prof. Dalby.

With this background it is not surprising that Mr. Blair at all times took a keen interest in technical education, and it is characteristic of the man that, long before industry began to show its present concern in this vital activity, Mr. Blair was much occupied in it from the point of view of his apprentices and of their welfare. He was the first chairman of the Joint Committee for the award of National Certificates in Northern Ireland and later became a member of the Committee of the Belfast College of Technology.

Atholl Blair's professional career was a most impressive one. His contribution to the national

effort in two world wars was massive. He expected a great deal from his subordinates and demanded more from himself. For all this he will be long remembered, but those who were privileged to share his friendship will greatly miss the loyalty and warm human understanding of a man of sterling character. In his busy life he had not much time for taking part in formal activities outside his work, but he had a sound knowledge of art and a keen interest in the world around him. He at one time prepared to take up architecture as a career, and must have derived satisfaction from the fact that one of his sons became an architect and the other an engineer.

D. H. ALEXANDER

NEWS and VIEWS

Orbit of the Artificial Earth Satellite

THE artificial Earth satellite was launched from the U.S.S.R. on October 4. By a considerable feat of improvization, Mr. Martin Ryle and his team at the Mullard Radio Astronomy Observatory near Cambridge have been able to record the radio signals transmitted by the artificial satellite from October 5. Improvement of the technique has provided results from which a preliminary orbit has been calculated (*Brit. Astron. Assoc. Circular*, No. 390; October 15, 1957):

Epoch		October 8–9, 1957
Inclination	i	64·9° (from two methods)
Eccentricity	e	0·06
Period	P	96m. 2s.; − 1·5s. a day
Maximum height		970 km. (630 mi.), at latitude − 45° approx.
Minimum height		190 km. (118 mi.), at latitude + 45° approx.
Precession of node		3° 40′ a day.

A report from the United States gives the maximum height of the orbit above the Earth as 583 miles and the minimum as 143 miles, and states that the carrier rocket was travelling three minutes ahead of the satellite on October 12. An important feature of the elliptical path, which will enable valuable information of the outer atmosphere to be obtained, is that it runs into and then out of the ionosphere.

A telegram from the Bureau of the International Astronomical Union gives particulars of an equatorial ellipse for the artificial satellite computed by Lautman, Slowey and McCrosky at the Smithsonian Institute, namely:

Epoch, October 9·405 U.T. 1957

v	266° 24′	(True anomaly)
ω'	61 47	Equator 1957·0
Ω'	327 20	Equator 1957·0
i'	64 16	Equator 1957·0
φ	2 56	(e = 0·0512)
a'	1·08908	(in equatorial radii of Earth)

Mr. D. H. Sadler reports, following observations at the Royal Greenwich Observatory by K. C. Blackwell and W. A. Scott, that the carrier rocket is now visible in the British Isles in the morning twilight, the magnitude varying between about − 1 and + 3, moving at a height of about 430 km. from north-west to south-east. On October 13 it was approximately over Bournemouth at 5h. 26m. U.T., the track moving south-west, parallel to itself, about 200 km. a day. The time will be earlier by about two or three min. a day. The satellite itself follows behind the rocket, at present by about five minutes.

New Atomic Patents

THE specifications of three patents developed within the United Kingdom Atomic Energy Authority are about to become generally available. They are all connected with the design of the graphite structure used in the building of Calder Hall nuclear power station. A number of factors influence the design of graphite moderators, one of the most important being the phenomenon of growth under irradiation (generally referred to as Wigner growth) and this is affected by the quality of graphite, the direction of grain, neutron bombardment and temperature, and in turn led to careful consideration of the design of individual blocks. The production of the graphite itself was the subject of intensive study, and quality varies between the outer perimeter and the centre. The patents involved, which also include details of fuel element support, are: No. 784,291, open for inspection on October 9; No. 784,292, open for inspection on October 9; No. 785,876, open for inspection on November 6. Specifications may be obtained from the Patent Office (Sales Branch), 25 Southampton Buildings, London, W.C.2, price 3*s*. 6*d*., including postage.

Proton-Synchrotron at Harwell

THE Governing Board of the National Institute for Research in Nuclear Science announces that a contract has now been signed for the supply of the magnet yoke which is a major component of the 7,000 million eV. proton-synchrotron being built for it on a site adjacent to the Atomic Energy Research Establishment at Harwell. The contract has been signed with Messrs. Joseph Sankey and Sons, Ltd., who have undertaken to supply the 340 steel blocks required, each weighing twenty tons, at a total cost of more than £1,250,000. The special steel required will be supplied by the Steel Company of Wales.

Thermionic Valves

ON October 3, Mr. T. E. Goldup delivered his inaugural address as president of the Institution of Electrical Engineers for the session 1957–58, his main subject being thermionic valves. After briefly tracing the history of the great strides made in this field over the past fifty years, he dealt in some detail with several examples of modern developments, and with the new manufacturing processes it has been necessary to devise for the successful and economic exploitation of the results of research; these processes were illustrated by means of a short film. From the simple beginnings of Fleming's diode and de Forest's triode the field of thermionic valves has extended to include microwave valves, television camera tubes, transistors and 'masers', and a whole family of related devices which have become an all-important factor in every branch of engineering and science—a factor which more than any other has not only shaped but determined the progress in electrical engineering as it is known to-day. Mr. Goldup also referred in his address to the urgent need for a great increase in the number of adequately trained engineers and scientists, and discussed some of the associated