the present ruins. They lived by a rude kind of farming, growing maize, beans, and melons; their women had some skill in pottery. They seem to have used their underground Kivas as places where they carried on a constant round of tribal ceremonial. They lived a retired life, and were little influenced by foreign culture. The ruins have now been carefully restored under the supervision of Dr. Fewkes, whose report, fully illustrated, gives an excellent account of a strange forgotten race.

LOW-TEMPERATURE RESEARCH AT THE ROYAL INSTITUTION.[1]

A SUMMARY of the work carried on with the aid of the Hodgkins Trust is, by the authority of the managers, incorporated in the Proceedings of the Royal Institution every seven years. Like the preceding report, which chronicled the solidification of oxygen, the liquefaction of fluorine, and the liquefaction and solidification of hydrogen, the essay in which the achievements of the years 1900 to 1907 are described by Prof. Armstrong is again concerned mainly with low-temperature investigations.

No fewer than thirty-five original publications are referred to, the main feature running through them being the discovery and use of the charcoal vacuum, a practical advance only less important than the introduction of vacuum vessels in the manipulation of liquefied gases. At the temperature of liquid air the absorption is from six to thirty-four times as great as at 0°, and depends but little on the pressure, so that very high vacua can be produced. The density of the occluded gas is substantially that of the liquid, 0·06 against 0·07 for hydrogen, and 0·17 against 0·15 for helium. Owing to their slight absorption by charcoal at −185°, the presence of hydrogen and neon in air can be detected readily by connecting a vacuum tube with a vessel containing charcoal cooled in liquid air; if the gas be enriched by starting with a larger quantity and submitting it twice to condensation by cold charcoal, the spectrum of helium can also be detected.

The fact that helium is not condensed by charcoal at −185° was made use of by Prof. Onnes in the experiments which culminated in the liquefaction of helium, the one gas which had resisted all attempts to liquefy it at the commencement of the period under review; only by this means was it possible to maintain the purity of the helium and to ensure that the circulation of the gas could be maintained undisturbed by condensation of solid hydrogen and solid air. The indebtedness which he owed to Sir J. Dewar's discoveries was fully and generously acknowledged by Prof. Onnes in recording this great achievement.

ANNIVERSARY MEETING OF THE ROYAL SOCIETY.

THE anniversary meeting of the Royal Society was held as usual on St. Andrew's Day, Tuesday, November 30, when the report of the council was presented, and an address was given by the president, Sir Archibald Geikie, K.C.B. An account of the main subjects that occupied the attention of the council during the past year is given in the report, from which extracts are here subjoined. Other matters mentioned in the report have been referred to already in these columns.

[1] Low-Temperature Research at the Royal Institution of Great Britain, London, 1900–7. Essay by Prof. H. E. Armstrong, F.R.S. II. The Charcoal Vacuum Septenate. Pp. 63. (Hodgkins Trust, 1909.)

REPORT OF THE COUNCIL.

Results of the National Antarctic Expedition.

The only part of the physical observations of the National Antarctic Expedition, of which the Royal Society undertook the preparation and publication, that remains to be completed is the second volume on meteorology, which is now in progress. It will consist chiefly of synchronous charts of sea-level pressure, with winds and temperatures, over the greater part of the southern hemisphere. It will thus embody, not only the results of the observations made by the *Discovery*, but information derived from many other sources. The preparation of these charts is in the hands of the Meteorological Office under Dr. Shaw. It is anticipated that this laborious task will be completed in time to allow the volume to be published next year.

Glass-workers' Cataract.

The inquiry into the disease known as glass-workers cataract, instituted at the request of H.M. Government, and referred to in the last report, has been pursued during the year by the committee appointed by the council. The scheme of operations drawn up by the committee includes experimental research in the laboratory, and also investigations at some of the principal glass manufactories, with the view of obtaining data of the processes of glass-manufacture and of the incidence of the disease among operatives. Some progress has been made in this latter branch of the inquiry, but the work of the committee has been hindered by the refusal of certain glass manufacturers to allow the committee to visit their works. The experimental researches in the laboratory are proceeding.

The National Physical Laboratory.

The need for increasing accommodation is greatly felt in several departments. This is specially the case in the department of metallurgy, referred to by Lord Rayleigh in his address last year. With regard to this the executive committee of the laboratory report:—

"Investigations of very real importance have to be declined, because of the need of appliances, and the general scale of the arrangements is much too small. A site is available for a new metallurgical laboratory adjoining the chemical laboratory, and it is highly desirable that during the coming year active steps should be taken to secure the necessary funds. The committee commend this need to metallurgists interested in furthering investigations into the application of science to the practical treatment of metals and to other problems of importance."

The executive committee have nominated a special committee to raise the necessary funds for extension in this and other directions.

The most important event of the year, however, has been the work of construction of the national experimental tank, given to the laboratory with great generosity by Mr. A. F. Yarrow; this work is now well advanced. In April last Mr. Yarrow wrote to the secretary of the Institution of Naval Architects directing attention to the importance of such a tank, and offering to present a sum of 20,000*l.* on the understanding—

(1) That a tank of the most modern character can be established for a sum not exceeding 20,000*l.*, and that it be established at the National Physical Laboratory.

(2) That suitable provision be made, both as regards staff and means, for conducting research work, as well as for experimental investigations of a confidential character which private firms may desire, and for which they would pay suitable fees.

(3) That a sufficient sum be provided to ensure that the tank be efficiently carried on for a period of not less than ten years. This provision might take the form either of an endowment or of guaranteed subscriptions from shipbuilders and ship-owners.

Mr. Yarrow's letter continues:—"I believe that an adequate provision for maintenance would involve not less than 2000*l.* a year; that is to say, a total guarantee fund of 20,000*l.* would be required to maintain the efficient working of the tank for the above period."

In accordance with Mr. Yarrow's suggestions, a committee was formed by the Institution of Naval Architects to study the practicability of the scheme and the raising