anode circuit of the main valve. When variations take place in the control anode at speech frequency, very large surges are set up in that of the power valve, which may approximate to the original high-tension direct-current potential, and so sweep the output from nearly double its steady value to zero. The standard R.A.F. set is of the 20-watt size, with a high-tension supply of 600 volts direct current. A great advantage in the system for aeroplane work is that no critical adjustments are required. The arrangement of the apparatus is such that the set proper can be mounted in any convenient position, and only a very small control unit brought within reach of the user's hand. One switch makes or breaks the dynamo field, filament, and microphone circuits. A great deal of experiment was necessary before a suitable microphone was found, as it had to be almost insensible to sounds of "noise" intensity, but responsive to the powerful concentrated waves of a voice impinging upon it at a very short distance.

The receiving set depended upon high-frequency magnification, and was, in its first form, a three-valve arrangement. It consisted essentially of a detector valve with reaction and two note magnifications. The detector valve was not energised direct from the aerial, but through an aperiodic circuit, which was a circuit approximately syntonised by its self-capacity. The final adjustment for obtaining the best effect is made on a rheostat in the filament circuit carried on the "joystick" itself. These three-valve sets were employed to a considerable extent both before and after the armistice, but a five-valve receiver was developed later in which a choice was made of two high-frequency magnifications and two low, with a detector valve. This set was very much more sensitive than the three-valve arrangement, and enabled fixed aerials rigidly connected to the wings and fuselage to replace the trailing aerial, which latter was a great embarrassment in fighting. The normal safe range of the apparatus is about four miles from machine to machine, while the range to a ground station is from twenty to fifty miles or more. The author anticipates that in the future the wireless apparatus will be able to be plugged through on to the ordinary exchange lines, so that a man sitting in his office will be able to hold a conversation with a machine in the air.

Magnetic Storm of March 4-5.

THE Director of the Meteorological Office has been good enough to send us the subjoined communication from Dr. Chree concerning a magnetic storm which occurred on March 4 and 5. It may be mentioned that on these days the sky was mostly overcast in Scotland, though there was very fine weather in the South of England. We are informed that the only aurora observation reported so far was made at Aberdeen at 1h. 30m. on March 4, *i.e.* ten hours before the "sudden commencement" of the storm :—

"A considerable magnetic disturbance was recorded at Kew Observatory on the night of March 4–5.

"There was a well-marked S.C. (sudden commencement) at about 11h. 40m. on March 4. This was of an oscillatory character both in D (declination) and H (horizontal force). The first, smaller, movement was a fall in H and an easterly swing in D, the range of the oscillation being about 45 γ in H and 7′ in D. H retained an enhanced value for four or five hours after the S.C., and no really large movements occurred until after 17h. on March 4. The most disturbed time was from 18h. on March 4 to 9h. on March 5. On the whole, H was falling from 17h. on March 4 until after 2h. on March 5, the maximum being recorded at about 16h. 20m. on March 4, the minimum at about 2h. 5m. on March 5, and the range being approximately 300 γ. The H curve had become quiet before 10h. on March 5, but still showed a depression of about 75 γ.

"The D trace was off the sheet, in the direction answering to easterly displacement, for fully twenty minutes between 22h. and 23h. on March 4; so the range recorded, 60′, may have been considerably exceeded. The maximum westerly displacement occurred at about 18h. 35m. on March 4.

"From 12½h. to 17½h. on March 4 the D trace was practically normal except that the declination was 1′ or 2′ more westerly than usual. Thus the disturbance was rather a conspicuous example of the lull that not infrequently intervenes between the S.C. and movements that would be recognised as constituting a magnetic storm."

University and Educational Intelligence.

CAMBRIDGE.—Mr. E. V. Appleton, of St. John's College, has been appointed an assistant demonstrator in experimental physics.

It is proposed to confer the honorary degree of D.Litt. on the Abbé Henri Breuil, professor of the Institute of Human Palæontology at Paris.

It is proposed to create a readership in the morphology of vertebrates and a lectureship in zoology in place of the present readership in zoology.

Besides additions and improvements to the chemical laboratory and the erection of the Molteno Institute for Parasitology, other building schemes are in view for engineering, physics, and also for the University library. The last proposal to meet the difficulty of finding room for books was to excavate a large underground chamber. The cost of this has been found to be prohibitive, and the Senate has recently discussed a revival of an old scheme to erect a new building akin to the Senate House and on the south side of Senate House Yard. If this scheme is adopted a public appeal will be made for subscriptions towards the erection of the building.

LEEDS.—Mr. W. E. H. Berwick has been appointed lecturer in mathematics in the University. Mr. Berwick was assistant lecturer in the University of Bristol for two years, and afterwards became lecturer in mathematics in University College, Bangor. For two years he was engaged on the technical staff of the Anti-Aircraft Experimental Section of the Munitions Inventions Department at Portsmouth, where he made important contributions to the experimental and computative theory of gunnery. He has published a long series of papers in the Proceedings of the London Mathematical Society and elsewhere.

OXFORD.—Prof. R. A. Sampson, Astronomer Royal for Scotland, has been appointed Halley lecturer for 1920.

THE governors and trustees of Tancred's studentships propose to elect a student in physic at Gonville and Caius College, Cambridge, at Whitsuntide. The annual value of the studentship is about 95*l*. Particulars are obtainable from Mr. E. T. Gurdon, 28 Lincoln's Inn Fields, W.C.2.

THE sixth annual report of the Carnegie United Kingdom Trust is an account of the work done by the Trust in 1919, and contains a statement of income and expenditure for the year. The committee had hoped that the coming of peace would have brought with it a great opportunity for institutions which