

by two pneumatically operated valves near the top and there are four inverted open canvas chimneys in the bottom, 7.5 ft. in diameter and 17 ft. long, to relieve it of surplus gas when fully inflated by the reduction of the external pressure.

The total lift of the balloon on the ground is more than 8 tons. This figure includes the weight of the balloon itself, men, equipment and ballast. The gondola is 9 ft. in diameter and weighs 638 lb. empty. It is painted white both inside and externally above the equatorial plane and black below. An arm, 14 ft. long, extends horizontally from it carrying a fan on the end, which supplies a tangential force to rotate the whole balloon. The gondola is provided with an 80 ft. round point triangular parachute operated by a pilot parachute to draw it from its bag.

#### INSTRUMENTS AND EQUIPMENT

The bag is provided with a 3-ft. dial thermometer near the top to be viewed directly from the gondola through porthole and vent. For cosmic ray studies, Prof. R. A. Millikan has supplied three ionisation chambers, one exposed, one in two inches of lead and one, weighing 600 lb., in four inches of lead. Dr. W. F. G. Swann has supplied counter sets for various elevations from the horizontal, a lead-shielded chamber for 'bursts' and a Wilson expansion chamber. Mr.

O. H. Gish has supplied an apparatus consisting of a vertical chimney external to the gondola 1 ft. in diameter and 3 ft. high for a continuous ion count of the external air. Sun, sky and earth brightness records will be taken from outside the gondola, and records made of temperature and barometric pressure with resistance thermometer and short mercurial barometer respectively. The readings of the latter will be further checked by vertical camera studies of the ground and transit circle observations of the balloon made from the ground.

The sun and sky light will be studied spectrographically both from within and without the gondola for ozone content of the stratosphere. Mention has already been made of the vertical camera for height observations, but other cameras will photograph the horizon to obtain the figure of the earth, and a motion picture camera is provided to record any moving events. Air samples will be taken and spores collected, and even cultures of fruit flies are to be exposed to the rigours of the stratosphere. Finally, the observers will be in continuous radio communication with the ground on a transmission of 13,050 kilocycles per second, and a study will be attempted of the diffraction by the horizon of two sets of modulated waves emitted from the gondola aerial at 56,000 kilocycles and 112,000 kilocycles a second respectively.

### News and Views

#### Retirement of Sir George Adam Smith

WHEN the autumn term begins, the Very Rev. Sir George Adam Smith will retire from the principalship of the University of Aberdeen. His long service of twenty-six years as principal exceeds that of any of his predecessors since the present University arose from the union of "The King's College" and "The Earl Marischal's College" on the passing of the first Universities Act of 1858. He has watched and guided the University during a period of notable development, when a demand for specialisation has increased the teaching staff by the addition of nine professorial chairs, three readerships, and forty-seven lectureships; and when these changes, together with an increase in the number of students from 1,007 to 1,272, have required considerable additions to the fabric of the University itself. Of equal importance for the future of education and of scientific research has been the formation of linkages binding the University as a working unit with other institutions. In the present year the former United Free Church College in Aberdeen has joined with the University, and co-operation of great promise for the development of biological investigation in the north takes place with the Rowett Institute for

Research in Animal Nutrition, the Macaulay Institute for Soil Research, the Scientific Laboratory of the Fishery Board for Scotland, and the Torry Research Station. In the course of another year a new and vital link between the teaching and clinical aspects of medical subjects will be completed at the new Infirmary. These developments, on which, in some directions, the future of the University depends, Sir George has guided with a tact and balance of mind and with a friendliness and humanity which have endeared him to his fellow-workers in the University; and both town and University appreciate his services in ensuring that common appreciation, co-operation and goodwill unite the civic and academic interests of the community.

#### Valentin Magnan

THE eminent French psychiatrist, Valentin Jacques Joseph Magnan, the centenary of whose birth was celebrated on May 27 by a special meeting of the Société médico-psychologique, was born on March 16, 1835, at Perpignan, which was also the birthplace of three other celebrated French psychiatrists, Pinel, Esquirol and Falret. His medical education took place first at Lyons and then in Paris, where he

qualified in 1866 with a thesis on the anatomical lesions in general paralysis. The following year he was appointed physician to the Asile Sainte-Anne, to which he was attached for forty-five years. His most important work was concerned with the psychoses produced by alcoholism, in the modern investigation of which he was a pioneer, absinthe, in the prohibition of which in France he was mainly instrumental, and morphia; epilepsy, and sexual anomalies and aberrations. As director of Sainte-Anne, where he founded the Société clinique de médecine mentale, he was an enthusiastic advocate of the no restraint system and especially of the suppression of the straight-jacket. His clinical lectures, which attracted numerous French and foreign physicians to Sainte-Anne, were for thirty years published in *Le Progrès Médical*, of which the issue for June 8 commemorates the centenary. In 1893 he was elected a member of the French Academy of Medicine, of which he became president in 1915. In his will he left the sum of 25,000 francs to the Academy for the foundation of a prize in psychiatry which bears his name. His death took place on September 27, 1916, when he had reached the age of eighty-one years, his faculties remaining intact until the end.

#### Basutoland in Transition

FUNDAMENTAL changes in the life and economy of the natives of Basutoland are foreshadowed by the report (Cmd. 4907. H.M. Stationery Office) of the Commission, of which Sir Alan Pim is chairman, appointed by the Secretary of the Dominions to inquire into the financial and economic position of the country. The recommendations are drastic and affect almost every aspect of native life. The gravity of the financial situation, which dictated the appointment of the Committee in the first instance, shows no sign of alleviation, and even in the improbable contingency that the proposals are entirely set aside, the force of circumstances alone, it would seem, will bring about disastrous changes which will lead to the breakdown of native culture and the system of administration. The spirit of independence and pride of race characteristic of the Basuto people should be preserved at all costs as the essential condition of their future progress. Their spirit is explicitly recognised in the Report as a dominant factor in the problem of reform; but it is pointed out that, unless rightly directed, it may prove an obstacle in the way of advance towards the goal the Commission has in view—the creation of a real system of 'indirect rule'. In the multiplicity of topics discussed and of ameliorative measures suggested, this is the major issue. While the financial situation of the Protectorate has undoubtedly complicated its political future, the internal situation and the formulation of a settled administrative policy which will afford opportunity for the development and utilisation of the admittedly favourable traits in native character and culture must obviously be a prior consideration to that of the eventual transfer of responsibility to the Union of South Africa.

#### R.A.F. Big Flying Boat

THE performance figures of the *Saraband* built by Short Brothers of Rochester for the R.A.F., just divulged for the first time although the machine was built in 1932, show that it is by far the largest flying boat in the R.A.F. equipment, and is more powerful than even the German *D.O.X.* Its engines total 5,500 horse-power, maximum speed 150 miles an hour, climb 750 ft. a minute, with an air range of 1,450 miles, with full load. In this respect it is worth remembering that many countries make a practice of reporting performance trials with specially lightened loads. The machine has a wing span of 120 ft. and is 90 ft. long. It carries a military load of 5,960 lb., which includes an automatic pilot, the usual machine guns, and a 1½ in. automatic quick firer. The hull is a self-contained unit, containing sleeping accommodation for the crew, a workshop, a ward room, a drying compartment, an anchor winch, and gear for changing engines afloat. It is built entirely of steel and duralumin, and the hull design incorporates many novel structural features. A civil flying boat of the same size was under construction at the same time, but was stopped for reasons of economy.

#### Presentation of Prof. Piccard's Gondola to the Science Museum

ON June 12, the gondola of the balloon in which Prof. A. Piccard and M. Max Cosyns ascended into the stratosphere on August 18, 1932, was presented to the Science Museum, South Kensington, by M. Jean Willems, director of the Fonds National de la Recherche Scientifique, Brussels. His Excellency the Belgian Ambassador presided, and both Prof. Piccard and M. Cosyns were present. The gondola consists of an air-tight sphere (about 2 metres in diameter) of aluminium alloy, fitted with two man-holes and several portholes, and equipped with various scientific instruments; it was attached to the hydrogen-filled balloon with which Prof. Piccard made his previous ascent on May 27, 1931. The second ascent, in 1932, was made from Dübendorf Aerodrome, near Zurich, and after a twelve-hour flight, the balloon landed safely in a field at Cavallaro di Monzambano, about ten miles south of Lake Garda. The maximum height reached during the voyage (determined trigonometrically) was 16,940 metres (10½ miles). The main objective of the flight was the investigation of cosmic radiations. Observations were made to ascertain the variation of intensity of these rays with height, and the distribution of the radiation in different directions was studied by means of a tubular Geiger counter.

#### Early Design for an Aeroplane

THE Science Museum, South Kensington, has just acquired through the generosity of Mr. P. A. Smith of Scarborough a small disc of silver about an inch in diameter bearing an engraved design for a flying machine which is remarkable in conception. The disc bears the initials 'G.C.' with the letter 'R' beneath and it is dated 1799. The reverse contains a diagram of forces relative to the design illustrated.