is most desirable that men on furlough from the tropics should have somewhere to go where they can finish off any research work that they may have on hand. The services of the library to the man in the tropics, as well as to the worker in Great Britain, will be no less valuable. For, with the collaboration of the Bureau of Hygiene and Tropical Diseases which will be housed in the building, it is hoped to develop something approaching an international information bureau in all subjects within the purview of the school. The museum also, which will be open to the public, will play an important part, both educational and propagandist. It consists of three parts: sanitary engineering, general hygiene, and tropical medicine. Many of the exhibits have been prepared and presented, and will be kept thoroughly up-to-date by large commercial interests concerned in public health activities of various kinds.

The building which is to subserve this varied array of functions is a massive block in Portland stone lying just north of the British Museum (Fig. 1). The successful design was submitted by Mr. P. Morley Horder, and Mr. Verner O. Rees, in association with Mr. Horder, has carried through the execution of the design so submitted; and despite the economy in external ornament, dictated by the practical needs of the building, the architects have succeeded in making a very pleasing contribution to the architecture of Bloomsbury. The building consists of four main stories with a recessed floor above these, and finally a small top floor composed mainly of animal houses. The walls and foundations have been so constructed that they will support another story should this eventually become necessary.

The general plan of the building is that of a letter H, with the long sides on Gower Street and Malet Street, a cross-bar uniting the two and separating the north and south courts, and with the foot of the H closed by the main front which faces south on to Keppel Street. The severity of the Keppel Street elevation is relieved by a wide frieze composed of wreaths and of the names of some of the pioneers in hygiene and tropical medicine; and a lively series of gilded designs, representing some of the animals which concern the hygienist most closely, are set in the metal balustrades below the first floor windows. These ornaments are continued some way along Gower Street and Malet Street, but beyond this the side elevations are relieved only by the prominent entrances. The main entrance, in Keppel Street, is surmounted by a large panel engraved with the handsome seal of the School.

Probably the most striking feature about the interior of the building is the abundant supply of light and air. The passages are considerably wider than is usually the case in a building of this type, and this reflects the intention of the architects to ensure that the School should in no way fall short of those principles which it will be its main function to inculcate. With the exception of the main lecture theatre, ventilation is secured throughout by natural means; the large open courts help to make this possible. The working departments occupy the sides and cross-bar of the H, and the planning of these departments has varied with their respective functions. The base of the H, the Keppel Street front, contains those sections which are of more immediate concern to the outside public; and in this part, naturally, more concession has been made to architectural effect.

Immediately beyond the entrance hall and occupying the south court is the main lecture theatre. It is the easiest part of the building to find; a most convenient arrangement, for this theatre will frequently be used for 'outside' lectures. On the first floor, the entire frontage is occupied by the library, a wide, imposing room, unbroken by pillars, panelled throughout with oak (Fig. 2). Immediately behind the library, access is provided to the flat roof of the lecture theatre, which will be laid out as a garden court. The second and third floors comprise the museum; the lower devoted to hygiene, the upper to tropical medicine, both splendidly illuminated by large windows in the north and south walls and by three open wells admitting light from above.

The opening ceremony was performed by H.R.H. the Prince of Wales on July 18, almost exactly three years after the foundation stone was laid by Mr. Neville Chamberlain as Minister of Health. The Prince of Wales was received by Lord Melchett, chairman of the Board of Management, who read an address of welcome which outlined the history and functions of the School. In his reply, the Prince of Wales stressed the importance of this great benefaction as a sign of Anglo-American friendship, and expressed his belief that the opening of this School would inaugurate a new era in preventive medicine. When Sir Holburt Waring, chairman of the Court of Governors, had returned thanks to the Prince of Wales for his attendance, and had been supported by Sir Gregory Foster, Vice-Chancellor of the University, His Royal Highness visited the various departments of the building. The assembled company was entertained to luncheon as the guests of Lord Melchett, the building was thrown open for general inspection, and a series of kinematograph displays showing some aspects of preventive medicine were exhibited in the lecture theatre. The School achieved a very gay and successful debut, and, given adequate financial support, there is every reason to expect that it has before it a long and prosperous career "in the Service of Mankind".

History of Science Exhibition at Florence.

THE first National Exhibition of the History of Science is being held from May to October of this year at Florence. It is of great interest to those concerned with the story of the development of scientific thought, although this development is somewhat obscured by the grouping of the exhibits according to their local origin rather than in logical or chronological order.

Of the various sections of the Exhibition, perhaps the most important are those in the rooms illustrating the discoveries of Leonardo da Vinci and Galileo Galilei. Here are interesting models of flying machines constructed in accordance with the descriptions in Leonardo's "Codice del Volo degli Uccelli". Among them is a machine to be fitted to the shoulders, and another of a canvas wing, the formation of which, similar to that of a Venetian blind, was imitated from the wing of a bird. Other designs show Leonardo's final device for the motion of the wings, his "macchina volante con piano portante", representing the final perfection of the type. There is also Leonardo's parachute and his instrument devised for the solution of the problem of the Arabian mathematician, Alhazen.

A number of models illustrate the experiments and discoveries of Galileo. There is the inclined plane for testing the rate of descent of bodies, the semiparabola illustrating the path traversed by objects horizontally projected, and the apparatus that illustrates the action of the pendulum. Here, too, are the 'Compasso di proporzione' or 'military compass',

invented by Galileo in 1596, and a photograph of the first lens constructed by him in 1610, with a diameter of 4 centimetres. There are also various astronomical and other instruments of the sixteenth and seventeenth centuries. Thus we have an apparatus for the discharge of projectiles, with pistol and quadrant attached to it, which belonged in 1597 to Robert Dudley, Duke of Northumberland, and a lens of 1690 used by Averani and Targioni for experiments on the action of solar rays on precious stones, and by Donati for the observation of stellar spectra.

The Exhibition contains many first editions and manuscripts of famous scientific works. Among these are Galileo's "Compasso geometrico" printed at Padua in 1606, the MS. of his first draught of the "Sidereus Nuncius", his "Il saggiatore" (Rome 1623), and his "Delle cose che stanno in su l' acqua" (Florence 1612). There is also Galileo's autograph letter in defence of his "Tractate" on the motion of the earth, from the Biblioteca Roncionana di Prato. Among other early editions of famous works is a copy, printed at Florence in 1611, of Kepler's "Narratio de observatis a se quatuor Iovis satellitibus erronibus".

More modern scientific developments are also represented in the Exhibition. There is a case of manuscripts of Galvani (1737–1798), among which is the holograph copy of his "De viribus electricitatis in motu muscolari". The telescope, microscope, and other instruments used by G. B. Amici are shown, with a copy of the famous electromagnetic machine of Antonio Pacinotti and a case of his manuscripts.

The Turin and Milan rooms are mainly devoted to the development of modern engineering. Here is exhibited the Sommeiller perforator, used in the construction of the Mont Cénis tunnel, the first F.I.A.T. automobile of 1899 and material relating to the making of the first Italian railways. There is a case of autograph letters by Galileo Ferraris, the physicist (1847–97), and the original apparatus constructed by him for the study of the rotating magnetic field. The first instruments used by Marconi, including condenser, receiver, transformer, etc., are to be seen. There is also a case of early printed pamphlets relating to aeronautics, among which is Blancard's "Relation du 15me voyage aérien fait à Francfort A.M. le 3 d'octobre 1785".

It is impossible to close an account of this Exhibition without mentioning the very interesting exhibits of the Reale Academia Nazionale dei Lincei. Among these is a series of manuscript volumes of the proceedings of this famous Italian predecessor of the Royal Society. The first volume is dated 1603, the year of the foundation of the Academy by Prince Federigo Cesi. This case contains also the first editions of some notable works by the early Lincei, including the "De nova stella disputatio" by Johan Eck (Rome 1605), the "De aereis transmutationibus", by Giovanni Battista Porta (Rome 1614) and Galileo's "Il saggiatore" (Rome 1623). In another case are the MS. volumes of the proceedings of the Academia del Cimento, dated 1666 and subsequent years.

The Official Guide and Catalogue to the Exhibition can be obtained on application to the Direzione, Prima Esposizione Nazionale di Storia della Scienza, Piazza Cavour, Firenze. S. D. WINGATE.

Long Delayed Radio Echoes.

PRINCIPAL PEDERSEN, of the Technical College, Copenhagen, has communicated a paper in English on "Wireless Echoes of Long Delay" to the physical section of the Danish Royal Society, which shows that scientific workers hold very different opinions on this subject.

Störmer, Pedersen, and Wagner think that the echoes are caused by radio waves being reflected from swarms of electrons out in space, whilst others, van der Pol, Appleton, and Ardenne, assume that the long delay is due to special conditions in the Heaviside-Kennelly layer. To account for the long delay which sometimes occurs before the arrival of the echo, Ardenne assumes that the waves travel round the earth some hundreds of times. Owing, however, to the necessary attenuation, this assumption presents great difficulties.

Principal Pedersen gives a mathematical proof that the long delayed echoes cannot arise either by the propagation of radio waves within the earth's atmosphere or by the waves travelling outside the latter in a medium so strongly ionised that the group velocity of the electrons approaches zero. In his opinion they are due to the fact that the waves have travelled very great distances outside the earth's atmosphere and have then been reflected by swarms or bands of electrons in space, as described by C. Störmer in NATURE (Vol. 122, p. 681, 1928). The assumption is made that all waves shorter than about 8 metres will penetrate into space with very little attenuation. At noon, all waves longer than about 40 m. are completely reflected or refracted back to the earth. At midnight the waves must be longer than 70 m. to be reflected back. The lengths vary appreciably with the ionisation of the upper atmosphere.

It is concluded by Principal Pedersen that echoes occurring after 10 seconds cannot be due to the propagation of waves within the earth's atmosphere. Echoes occurring after intervals of time up to 30 seconds are probably due to propagation along or reflection from Störmer bands. Occasionally echoes do not occur until several minutes have elapsed. In these cases the bands of ions must be outside the space in which the magnetic field of the earth exerts any appreciable direct influence.

University and Educational Intelligence.

ABERDEEN.—The degree of Doctor of Science has been awarded to Dr. A. N. Campbell, for a thesis entitled "The Existence of Liquid Racemates"; Sophia L. M. Connal (*née* Summers), for a thesis entitled "A Particular Study of 55 Species of Mosquitoes met with in Nigeria"; Mr. G. Redington, for a thesis entitled "The Effect of Light on Plant Growth".

CAMBRIDGE.—The Wrenbury Scholarship has been awarded to L. J. V. Shepherd, of St. John's College. Miss A. S. Dale, of Newnham College, has been re-elected to the Michael Foster Research Studentship in physiology. At Clare College the Denman Baynes Studentship has been divided equally between E. C. Bullard and R. M. Margoei.

EDINBURGH.—The Cameron Prize in practical therapeutics has been awarded to Sir Leonard Rogers, in recognition of the discoveries he has made in the treatment of several tropical diseases, and in particular in the treatment of cholera, amœbic dysentery, and leprosy. This prize is "awarded annually to a person who, in the course of the five years immediately preceding, has made any highly important and valuable addition to practical therapeutics".

LEEDS.—Dr. Ll. Lloyd has been appointed reader in entomology and protozoology.

LONDON.—Prof. H. H. Woollard has been appointed as from Sept. 1 to the University chair of anatomy tenable at St. Bartholomew's Hospital Medical College.