boys on the selection of subjects at the university to assist, not so much the Cambridge Botany School as the Empire as a whole, by encouraging promising pupils to consider the possibility of making an acquaintance with botany as an alternative to choosing what, to many, would be a more familiar and therefore an easier course—the further study of chemistry, physics, and mathematics ?

"This request is made partly because, in my opinion, a man who takes a degree in science should have some knowledge of a biological subject, but primarily because I am convinced of the vital importance of turning out men who can supply one of the greatest needs of the present day by devoting themselves to the investigation of problems which lie at the root of our national prosperity. There are, no doubt, many boys whose mental chords are more responsive to the calls of mathematics, physics, or chemistry than to those of biology : the trouble is a disinclination on the part of some schoolmasters to admit the probability that not a few of their pupils who have shown themselves to be competent students on the physics side might, given an opportunity, discover that biology is their destiny. The safe course at the university, it may be said, is a continuation of that followed successfully at school. I recall a Spanish saying : ' Go with God, Your Grace, and may nothing new happen.' On the other hand, it is perhaps desirable to encourage self-determination, to give all a chance of experiencing the joy of entering a new world, the thrill of a novel quest."

Prof. Seward also put in a plea for a little more geology, an extremely modest plea considering the importance of the subject and the fascination that it has for many boys. " I dare not suggest the addition of geology to an already overburdened curriculum, though I cannot help thinking that more effort might be made to bring boys into touch with this branch of natural knowledge, either by devoting part of a general elementary course in science to geological talks, or, in suitable districts, by encouraging boys to spend some of their free time, if they have any, in making observations for themselves, in collecting fossils—a by no means contemptible occupation—or by studying the more obvious phenomena connected with erosion and rock-building which provide clues to the interpretation of the documents from which geological history is compiled."

A little more autonomy in school certificate and matriculation examinations, or even a little more elasticity in examinations, would do a great deal towards equalising matters. University authorities are apt to blame advanced courses in schools, but the trouble begins with the school certificate, which is also the first statutory examination of a boy's university career. If he gets credit in chemistry and physics in the school certificate, he is entitled to think he has done something in those subjects and he is reluctant to make a fresh start for the higher certificate ; consequently, he does (as he sometimes puts it) chemistry and physics again. When he gets to the university, he is still more reluctant to strike out on entirely new lines.

When the Science Masters' Association meets, as it does, in alternate years at one of the universities—old or new—the members get what is in reality a short but intensive refresher course, relieved by very pleasant social intercourse. University professors and lecturers are astonishingly generous in providing most stimulating lectures, the laboratories and museums are all thrown open, visits to works and attractive demonstrations are arranged. The latest useful devices for aiding science masters in their work and the newest books are brought to their notice in the manufacturers' and publishers' exhibition. It is difficult to appraise the value of conferences, because they vary so much both in utility and in achievement, but whatever may be said in mild disparagement of the conference habit—the ' talker feast,' as our American colleagues put it—there is no doubt that these meetings of the Science Masters' Association are most stimulating and a powerful antidote to that bane of the schoolmaster's work—stagnation.

The next meeting of the Association will be held in London, in January 1930, under the presidency of Prof. James C. Philip, professor of physical chemistry in the Imperial College of Science and Technology.

Whales Landed in Scotland.

PROF. D'ARCY W. THOMPSON has written a most interesting account of the whales landed at the Scottish whaling stations during the years 1908–14 and 1920–27 (*Fishery Board for Scotland : Scientific Investigations*, 1928, No. 3), including a detailed examination of all the records, illustrated by sketch maps showing the place of capture, and by tables and diagrams, as well as a full bibliography of references to the species.

The old Scottish industry was almost at an end when in 1903 the harpoon-gun was introduced from Norway and gave a new impetus to whaling. The harpoon-gun was used in Ireland a hundred years before its re-invention by Captain Svend Foyn about 1865. It is apparently, however, not the harpoon gun alone which has made the modern whaling industry, but the gun used with the explosive bullet.

A system of licences was introduced in 1908, and full records with measurements are kept of all whales captured. Thus a large amount of valuable information is available on which the present paper is based. 6817 whales were landed in Shetland and Harris from 1908 to 1927 (excluding the years of the War, and 1919 and 1921, when no whaling was conducted). Seven species are represented, the Common Finner, *Balænoptera musculus*, being the commonest, the Bottlenose, *Hyperodon rostratus*, the rarest. In between in order of frequency come the Sci-whale, *Balænoptera borealis* ; the Blue whale, *B. Sibbaldi* ; the Sperm whale, *Physeta macrocephalus* ; the Nordcaper, *Balæna biscayensis* ; and the Humpback, *Megaptera longimana*.

Of these the Nordcaper or ' Sarde,' the whale of the old Basque fishery, is one of the most interesting. For some time it was thought to be extinct, but although never taken in numbers, 69 individuals, 35 males and 34 females, have been captured since 1908, nearly all of which have been landed at the whaling station at Bunaveneader and caught within an area lying to the west and south-west of the Hebrides and beyond St. Kilda. Most of these were taken in 1908 and 1909, and it is shown that there are very definite fluctuations in their occurrence, apparently dependent on variations in Gulf Stream water. In those years when the Atlantic overflow to the north-east is strongest these whales are scarce and vice versa, probably owing to their tendency to linger on the coasts of Britain when there is little Gulf Stream current to carry them northwards.

75 Sperm whales are recorded, all but one being males. They do not breed in Scottish waters, and it is thought that these were young bulls which had

been driven out of the herd. It is a remarkable fact that the Sperm whales caught in 1911 (when this species was exceptionally numerous) were all very fat, whilst those caught in 1909 and 1912 were very lean, and the Nordcapers caught in 1909 and 1912 showed the same leanness; and yet the diet of the Sperm whale is mainly cuttlefishes, and that of the Nordcaper consists of the smaller planktonic organisms.

University and Educational Intelligence.

CAMBRIDGE.—A bequest of the value of about £250,000 from the late Mr. John Humphrey Plummer, of Southport, is announced. The money is to be governed by trustees and is for the endowment of two chairs for the promotion of modern scientific research. No details are as yet available as to the conditions governing the trust.

LONDON.—The following courses of free public lectures, without tickets, are announced: "Fatigue," by G. P. Crowden, at University College, on Jan. 14, 21, and 28, at 5; "The Physiology of Reproduction," by Dr. A. S. Parkes, at University College, on Jan. 16, 23, 30, and Feb. 6, 13, and 20, at 5; "The Chemistry of Some Natural Drugs," by Dr. H. R. Ing, at University College, on Jan. 17, 24, 31, Feb. 7, 14, and 21, at 5; "Comparative Physiology," by C. F. Pantin, at University College, on Jan. 18, 25, Feb. 1, 8, 15, 22, Mar. 1, 8, 15, and 22, at 5; "Some Applications of Physical Chemistry to Steel Manufacture," by Dr. A. McCance, at the Imperial College of Science—Royal School of Mines, on Jan. 23, 24, 30, and 31, at 5.30; "Cytology in Relation to Physiological Processes," by Dr. R. J. Ludford, at University College, on Jan. 24, 31, Feb. 7, 14, 21, and 28, at 5; "The Current Work of the Biometric and Eugenics Laboratories [University College]," by Prof. Karl Fearson and others, at University College, on Jan. 29, Feb. 5, 12, 19, 26, and Mar. 5, at 5.30.

MORE than a hundred bibliographies of various subjects have now been issued by the National Book Council, 3 Henrietta Street, London, W.C.2. These lists of books do not profess to be exhaustive, but each is prepared under the auspices of a body competent to express an opinion on the subject with which a particular list deals. One of the latest lists (price 2*d*.) contains the titles of recommended books on popular science, or introductory to the various branches of science, and is compiled by Mr. J. B. Clark, late headmaster of George Heriot's School, and approved by the National Home-reading Union. The list is classified by subjects, and publisher, date, and price are given for each volume. It should be a valuable guide to the general reader who wishes to keep in touch with the progress of modern science.

A HARVARD-YENCHENG Institute of Chinese Studies is to be opened under the supervision of nine directors representing Harvard and Yencheng (Peking) Universities and the estate of the late Charles M. Hall of Niagara Falls, New York, who provided an endowment of two million dollars for it. The work of the Institute, which will be carried on at both universities, will include research in Chinese history, art, literature, philosophy, and religion, and special attention will be paid to the study of the Chinese language as a key to understanding the history and civilisation of China. There are already some fourteen hundred Chinese students in the United States, and numerous scholarships tenable in the United States are provided by the Chinese Educational Mission, while large sums are spent in promoting study and research by Americans in China. The new Institute will obviously strengthen the intellectual ties between the two countries.

Calendar of Patent Records.

January 14, 1822.—The lawyer's wig claims its share of the inventor's attention. On Jan. 14, 1822, there was granted to H. W. Ravenscroft, of Lincoln's Inn, peruke maker, a patent for his "forensic wig, the curls of which are constructed on a principle to supersede the necessity of frizzing, curling, or using hard pomatum; and for forming the curls in a way not to be uncurled; and also for the tails of the wig not to require tying in dressing, and further the impossibility of any person untying them."

January 15, 1820.—During the first hundred years of their existence, pianos, like spinets and harpsichords, were constructed entirely of wood, though the advantages of being able to use thicker and heavier strings had induced many attempts to introduce iron into the frames. William Allen, a tuner, and James Thom, the foreman, at Stodart's, one of the leading piano-makers in London, were the first to devise a satisfactory solution to the problem, and a patent was granted to them for their iron-frame construction on Jan. 15, 1820. The patent rights were at once bought by Stodart's and a great step forward towards the modern piano was made.

January 15, 1910.—The unsplinterable glass known as 'triplex glass,' which consists of two sheets of glass united by sticking between them a sheet of celluloid softened by a solvent such as acetone and subjecting them to considerable pressure, was invented by Édouard Benedictus of Paris. His French patent was applied for in August 1909, and the printed specification describing the invention was published on Jan. 15, 1910. The British patent was applied for a few days later and antedated to the date of the French application.

January 18, 1799.—The continuous papermaking machine was invented by Louis Robert, a mechanic in the employ of Didot St. Leger, paper manufacturer of Essones, France, a French patent being granted to him on Jan. 18, 1799. The French patent rights were assigned to Didot, but the practical application and development of the invention were due to the Fourdriniers of London, who had acquired the English rights from the patentee, John Gamble. Although an Act of Parliament was obtained extending the life of the patent to the year 1822, the patent was hotly contested and was finally set aside by the courts on a technical flaw, and the Fourdriniers lost not only their royalties but also the very considerable sum of money they had spent in perfecting the invention.

January 20, 1818.—The great tunnel enterprises of recent years were made possible by the invention of the tunnel boring-shield by Marc Isambard Brunel, the patent for which is dated Jan. 20, 1818. Brunel's shield—the general principles of which are the same as those of the shields in use to-day—was employed for the first time in 1825 for the construction of the Thames tunnel at Rotherhithe, which after long delays due to financial difficulties was finally completed and opened to the public in 1843. No other shield tunnel was built until 1869.

January 20, 1820.—Labour-saving devices have generally had their origin in the United States, and it was here that the standardisation of parts in gun-making and their manufacture on the interchangeable system was worked out and fully developed. One of the principle inventors in this field was Thomas Blanchard, a descendant from a Huguenot family which settled in Boston in the seventeenth century. The United States patent for his lathe for turning gun-stocks was granted on Jan. 20, 1820, and such was its importance that it was twice extended by Act of Congress, first in 1834 and again in 1848.