to the germ cell and to what that cell comprises at the moment of fertilization, all factors outside this fertilized ovum which may affect it being regarded as environmental, then, as Dr. Forsyth proceeds to show, the use of these terms quickly leads into error.

The fertilized egg, with its chromosomes and genes, has long been residing within its environment: the maternal body. It grows and differentiates, and soon, within the embryo that evolves, the gonads appear. These have now a multiple environment: the embryonic soma, the maternal body and the outside world. It is taught that the embryo's body is hereditarily derived, whilst the mother's is environmental; but, according to this argument, there must have been a time when the mother's body itself was the product of inherited factors exclusively, so that what was heredity at one time is now environment! The terms are apparently interchangeable, and therefore lose their distinctiveness. Then again, the embryo, just as do the chromosomes and genes themselves, grows because nutriment of every kind passes into it from its outer world. Thus the embryo itself must necessarily be a compound of heredity and environment, the two so inextricably intermingled that it is beyond our powers to disentangle them. This division of heredity and environment is purely hypothetical and artificial, and, Dr. Forsyth maintains, lacks experimental confirmation.

Dr. Forsyth then proceeds to argue that an environment itself can be inherited. The character of an individual is deeply moulded during early childhood by its parents. The latter are environmental influences. The characters of these parents were, in turn, largely fashioned in their childhood by their own parents; and these by theirs. Dr. Forsyth asks if this is not an instance of the transmission of hereditary psychological qualities. If so, then the moulding of a child's nature by its parents is environmental only when its own generation is taken into account, and, from the wider view of successive generations, it is hereditary.

These extracts, taken from Dr. Forsyth's paper, may serve to show that what he has to say must necessarily be of interest to the philosopher. The biologist, and especially the geneticist, will be provoked to wonder how Dr. Forsyth's difficulties arose. It is clear that they have their origins in the definitions he employs and in his lack of contact with experimentation. Did he but seek his solutions in the laboratory rather than in the library, he would quickly persuade himself that it is eminently possible to disentangle genetic and environmental forces and to study them separately. To all intents and purposes it is possible to stabilize and standardize the environment and, in this, examine the effects on development of different genes and, by using genetically identical individuals, to study the effects of different environmental factors. It is impossible to deny the facts revealed and abundantly confirmed by genetic experimentation, or to disregard the firm conclusions which have teen built so carefully upon them. There is no real conflict between the hereditarian and the environmentalist: each is right and both are wrong, for the simple reason that without an environment there could be no expression of genetic potentialities, and, in the absence of the power to become, no environment can evoke anything. Nevertheless, though the two are at all stages of the individual's development so interwoven, it is possible, by appropriate experimentation, to separate them and to study each alone.

Science News a Century Ago

The Royal Institution

ACCORDING to the *Gentleman's Magazine*, the anniversary meeting of the Royal Institution was held on May 1, 1837, the Duke of Somerset, president, being in the chair. "The report of the visitors announced that, after a long season of difficulty, the Institution was now placed in that independent station, which as the most active and popular establishment in the Empire, adorned with the celebrity imparted to it by more than one great philosopher, it ought always to have occupied. The whole of the debt had, during the past year, been cancelled, and a balance now existed in favour of the Institution. The premises were in a state of substantial repair, and the visitors expressed a hope for the speedy accomplishment of the proposal of giving to the exterior of the building an appearance more in accordance with the importance of the scientific body to which it belongs. The thanks of the meeting were voted to Mr. Faraday, for his devotion and services to the interests of the Institution, and the usual ballot for officers took place."

Power of Galvanism

THE issue of the *Dublin Journal of Medical Science* of May 1, 1837, contains the following note. "A paragraph is going the rounds, said to have been extracted from a late foreign Journal, but which, however, we cannot find in any of our exchange favours, which describes the restoration of speech, taste and hearing in a Polish officer who had been deprived of them ever since the battle of Ostrolenka in consequence of an unsuspected discharge of cannon. The concussion was so tremendous as to throw him down; and although there was not the slightest external wound, when he recovered himself he found that two of his senses, viz., taste and hearing, as well as the power to articulate words, were completely gone. All the eminent physicians of Vienna had made trial of their skill to restore the loss, but ineffectually. Being finally conveyed to Paris, the advice of M. Magendie was sought. He applied the galvanic fluid to the tympanum, and by that means speedily overcame the deafness."

Lyell and his "Principles"

WRITING to his sister on May 3, 1837, about his book "Principles of Geology", which had appeared during 1830–33 in three volumes, Lyell said: "I have at last struck out a plan for the future splitting of the 'Principles' into a 'Principles' and 'Elements', as two separate works, which pleases me very much, so now I shall get on rapidly. The latest news is, that two fossil monkeys have at last been found, one in India contemporary with extinct quadrupeds, but not very ancient—Pliocene perhaps—another in the South of France, Miocene and contemporary with Paleotherium. So that, according to Lamarck's view, there may have been a great many thousand centuries for their tails to wear off, and the transformation to men to take place."

William Henry Barlow on Lighthouse Illumination

ON May 4, 1837, Peter Barlow (1776–1862) communicated to the Royal Society a paper he had received from his son William Henry Barlow (1812–1902) entitled "On the Adaptation of Different Modes

of Illuminating Light-houses, as Depending on their Situation and the Object contemplated in their Erection". The paper was contained in a letter sent from Constantinople on March 14, 1837. The younger Barlow had been trained as an engineer at Woolwich Dockyard, and in 1832 had been sent to Turkey by Mandslay, Sons and Field, to erect cannon-boring machinery, and had then been employed by the Turkish Government on the erection of lighthouses at the Bosphorus entrance to the Black Sea. The object of his paper was to investigate the principles on which the illuminating power, resulting from the employment of reflectors and of lenses, depends. He had arrived at the inference that the advantage gained by the employment of lenses does not arise from their superior perfection as optical instruments, but from their using the light more economically, in consequence of their producing less divergence of the rays both horizontally and vertically, and illuminating a much smaller space on the horizon.

Peter Barlow was for forty-one years professor of mathematics at the Royal Military Academy, Woolwich; his son became famous as a railway and bridge engineer, and was one of the committee appointed to consider designs for the Forth Bridge.

The Worary Poison

AT a meeting of the Medico-Botanical Society on April 26, reported in *The Lancet* of May 6, 1837, Dr. Hancock showed specimens of the worary plant gathered from the mountain Courantine on the Rio Parime, with a bundle of arrows poisoned thereby. Dr. Hancock said that worary was undoubtedly a species of *Strychnos*, although its flowers had never been seen by any botanist. The poison was put up in small gourds or fruit capsules of the worary plant, and the arrows were propelled by blowing them through a reed formed of a slender spike of palm. Divers false reports had been published with regard to the manner in which the poison was prepared and its toxicological effects on the animal economy. Many native charlatans living near the settlement made Europeans believe that it was formed of a great variety of substances, such as pepper, serpent's teeth and other such ingredients. The genuine poison, however, was undoubtedly prepared as an extract formed solely from the bark of the plant. Its mode of action was curious, for though when introduced into the blood it soon became fatal, when taken into the stomach, it produced no sensible effect, in which respect it differed from every other species of the *Strychnos* family.

United Service Museum, Whitehall

THE *Gentleman's Magazine* of May, 1837, gives the following account of the activities of this museum at that date: "Dr. Ritchie has begun a series of lectures on experimental Philosophy—the properties of matter —statics, mechanics, strength of materials, laws of motion, hydrostatics, etc., and Dr. Lardner is delivering others on the particular subject of steam communication with India.—Captain Norton, late of 31st regt., is also about to discourse on rifles, shells and sundry modern projectiles, with some remarks on the Boomerang, or New Holland spear, and on the ancient Balista. . . . . Already has the Museum acquired respectable funds from which it is proposed by the Council to found a permanent Professorship for the instruction of the members in mathematical and experimental science."

University Events

BELFAST.—Dr. J. H. Biggart, at present lecturer in neuropathology in the University of Edinburgh, has been appointed to the Musgrave chair of pathology as from October 1 next.

BIRMINGHAM.—Prof. L. G. Parsons has accepted an invitation to deliver the opening address at the annual meeting at Niagara Falls, Ontario, of the Canadian Society for the Study of Diseases of Children, and Prof. H. Beckwith Whitehouse, of the Department of Gynæcology, is to represent the British Medical Association at a conference at Ottawa in June next.

CAMBRIDGE.—It is recommended that the degree of M.A., *honoris causa*, be conferred upon Colonel F. J. Hayter, honorary keeper of the Australian and Fiji Collections at the Museum of Archæology and of Ethnology since 1928.

The Linacre Lecture will be delivered by Prof. A. V. Hill, Foulerton professor of the Royal Society, on May 10, at 5 p.m., in the lecture room of physiology. The title of the lecture will be, "The Heat-Production of Muscle and Nerve: A Critical Survey".

OXFORD.—Prof. T. G. B. Osborn, of the University of Sydney, has been appointed Sherardian professor of botany, as from October 1 next (see p. 746).

Dr. J. L. Stocks, vice-chancellor of the University of Liverpool, has been elected an honorary fellow of St. John's College.

Societies and Academies

Dublin

Royal Irish Academy, March 16.

J. J. DOWLING and T. G. BULLEN: Precision measurements with a radial deflection oscillograph. The cathode beam is caused to revolve in the annular space between an extra pair of concentric conical electrodes in a modified cathode ray oscillograph. Two applications are specially considered. Using a double frequency synchronized circular time-base, the radial deflection results in a limaçon-like curve. This was employed to measure instantaneously small variations in the radio-frequency of the Droitwich carrier-wave during the U.R.S.I. emission of March 1935. The use of high-speed spiral time bases in 'comparator' measurements of long time intervals (NATURE, **137**, 279; 1936) is also dealt with in detail. Preliminary results indicate that the difference in the periodic times of two two-second pendulums can be determined to one tenth microsecond in an experiment lasting less than half a minute. The method is being applied to the measurement of the gravitational attraction constant *G*.

Paris

Academy of Sciences (*C.R.*, 204, 925–1016; March 22).

HENRI LEBESGUE: A construction of the regular polygon of 17 sides due to André Marie Ampère, from some documents preserved in the archives of the Academy of Sciences.

CHARLES ACHARD, AUGUSTIN BOUTARIC and MLLE. SUZANNE THÉVENET: Viscosimetric researches on solutions of the various proteins of the serum.