Porritt and Dr. J. R. Scott. Methods used in the United States for testing ageing of rubber, paper and silk are described by W. E. Emley. The testing of road tar is discussed by G. Batta and that of asphaltic bitumens by Dr. J. P. Pfeiffer and R. N. J. Saal.

A general tendency towards elimination of the personal factor in testing is discernible in Sub-Group 5 (Colours and Varnishes), as may be seen from the general review by Dr. L. A. Jordan of methods of assessing behaviour of paint films in practice, and the description by Dr. E. Rossmann of test methods used in Germany. An apparatus for measuring the fastness of colours to soap solutions, water and perspiration, also designed to eliminate the personal factor, is described by W. Kaczkowski, while Prof. A. R. Matthis puts forward a simple and rapid method of measuring fluidity of oils such as are used in the paint and varnish industry. The corrosive action of insulating varnishes on copper receives attention in a paper by Dr. G. Rossi. Theoretical considerations of the effect of oxidation, polymerization and addition of plasticizers on the molecular structure of oil films are made use of by Dr. A. V. Blom to explain the effect of such agents on the mechanical properties of the paint and varnish films afterwards produced. A plea for more rational terminology in the industry is brought forward by H. Rabaté.

Group D (Subjects of General Importance)

The papers comprising Group D of the Congress are described as covering "Subjects of General Importance". They actually fall into three sub-groups: (1) the relation between the results of laboratory tests and behaviour in use and service; (2) the bearing of recent advances in physics and chemistry on the knowledge of materials; and (3) the properties of materials for the thermal and acoustical insulation of buildings.

The papers under (1) deal in a general way with problems which are more fully discussed in other sections, in relation to specific materials. The reviews of testing methods do not bring anything new before the Congress, but three papers, which from their titles may raise more important questions, have not been received in time for printing in advance. A paper by Sir Robert Hadfield and S. A. Main directs attention to the impossibility of imitating service conditions exactly in any laboratory test, and to the fact that most such tests are really designed to ensure that a given material conforms to a standard which has been found in practice to be satisfactory. It is pointed out that there is still no satisfactory means of determining resistance to abrasion, or the wearing quality of cutlery, whilst the behaviour of such parts as the pistons and piston rods of steam and pneumatic hammers under repeated shock is still imperfectly understood. Accelerated tests for resistance to corrosion are also very uncertain in their indications. M. Roš deals with the general question of factors of safety, giving values for a number of concrete instances.

Sub-Group 2 includes, besides several papers of a general character, an account of the methods to be adopted in testing for flaws in metals by means of gamma rays, by F. Guyot, and a short comparison between the methods of testing by X-rays and by radium, by Dr. V. E. Pullin. A. Pogány describes the study of the propagation of cracks in such masses as cement or concrete while under load in a testing machine by means of a microscope employing vertical polarized light. The gradual separation of the grains of sand from the matrix in a cement briquette can be clearly followed in this way. Sir Gilbert Morgan and his colleagues review the principal types of plastic materials of chemical origin, including synthetic resins and rubber-tar products, together with an account of the improvement of tar for road purposes by adding to it a calcium soap. The equations which have been proposed to describe the flow of dispersed systems are surveyed by M. Reiner.

The third sub-group is more homogeneous. The problems of insulating buildings against heat and sound are closely related, although the best materials for the one purpose are not necessarily the most suitable for the other. Several papers deal with the practical methods of studying the efficiency of different means of insulation against sound, particulars being given of the laboratories at Brussels, Berlin, Stockholm and Teddington, whilst P. Sabine, of the Acoustics Laboratory at Geneva, Ill., in describing the methods adopted by the American Standards Association, urges a careful standardization of test procedure among the various laboratories which are co-operating in this field. It is desirable that, by applying a correction factor to the results from any given laboratory, comparable figures should be obtained from which coefficients of wide practical applicability can be derived. Porous materials, such as slag or glass wool or various organic fibres, are used for both thermal and acoustical insulation, as is a construction consisting of sheets of solid material separated by air spaces. Dr. E. Griffiths refers to the use of lightweight concrete, made by mixing with the cement some substance which can cause the evolution of a gas and the production of a stable foam. With such an aggregate as pumice, foamed slag, or expanded slate, a very light concrete of open texture is obtained, with fair mechanical strength. The subject of protection against noise is one of public interest at present, and this series of papers provides much useful information concerning it.

Heredity versus Environment

IN a paper recently presented before the Eugenics Society, Dr. David Forsyth returns to that interminable argument 'Heredity *versus* Environment'. By him, heredity is taken to imply transmission from one generation to another, this transmission comprising structural and functional tendencies to develop organic life. By environment he understands the conditions around an organism. He has been examining the commonly accepted view that heredity and environment play indispensable parts in development, and that each operates separately from the other, and now finds it quite impossible to entertain this view any longer.

If, Dr. Forsyth argues, heredity and environment are indeed independent of each other, then it should be possible logically to trace the extent of the sphere of influence of each, their influences should be detectable separately, and their origins should be different. If this should prove on examination to be impracticable, then it must become necessary to jetison the present-day concept of heredity and environment as being two discreet forces, and to replace this by another more in harmony with the facts. If, as is done nowadays, heredity, as a term, is applied only

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