

of science upon museums, the force of which is apparent when it is remembered that the material pertaining to it therein stored constitutes the vital evidence of the value of all contributions to its advancement, and that without such evidence this branch of science would be reduced to a mass of personal testimony.

In view of the great scientific value of fossil remains the following remarks are offered concerning the precautions which are necessary in their preservation. It is true that most, if not all, these precautions are observed in a large part of the principal scientific museums of the world, but it is also true that much remissness in this respect has occurred in others. Besides the propriety of referring to the latter fact, these remarks are necessary to complete my statement of the claims of science which constitute the subject of this essay.

Three general classes of specimens of fossil remains should be recognised in museum collections, namely, typical, authenticated, and unauthenticated. Under the head of typical or type specimens are included not only those which have been described and figured in any publication, whether original or otherwise, but those which have in any public manner been so used or referred to. While all such specimens as these should at all times be accessible to any competent investigator, the risk of loss or injury is so great that they should in no case be allowed to be taken from the museum building in which they are installed. Such specimens are in a peculiar sense unique, and there can be no substitution and no equivalent in value. Their loss greatly reduces the value of every publication any part of which is based upon them, and to that extent retards the advancement of science. It is not enough that other, and even better, specimens of presumably the same species may be discovered; the former constitute the original, the latter only supposititious evidence. Besides the risk of loss or injury to type specimens by removal from the place of their instalment, their absence is a disadvantage to science. That is, no one investigator should be allowed their use to the exclusion of any other.

The term "authenticated specimens" is here applied to such as have been studied and annotated by competent investigators and properly installed. Such material constitutes the bulk of every important museum collection, and next to the type specimens already mentioned, they are most valuable. Their increased value is due to the scientific labour that has been bestowed upon them, and it needs only the additional labour of publication to constitute them type specimens and to make them of like value. Authenticated specimens when installed are ready aids to all investigators of such value, that even the temporary removal of any of them from a public museum is, to say the least, of doubtful expediency.

Unauthenticated specimens are, of course, those which have not been studied and installed, and they constitute the great mass of material from which authenticated and type specimens are drawn. Among them are those which constitute the material evidence upon which original observations in biological geology are based. If these are accompanied by the records and descriptive notes which are essential to their value, they constitute proper material for acceptance by museum authorities; but if not, their instalment should be refused, whatever their character may be. That is, to apply a statement made in another connection, no specimen of fossil remains should be admitted to permanent installation in any public museum which is not accompanied by such a record of the locality and stratum from which it was obtained, as will enable any investigator to revisit the same. In every case of instalment such records should be so connected with every specimen as to be readily accessible, and so arranged that the danger of loss or disconnection shall be reduced to a minimum.

The foregoing discussion of the claims of science upon museums is intended to embrace reference only to those which are devoted to the preservation of material pertaining to biological geology, but they are of more or less general applicability. These partial claims alone demonstrate the important relation that museums hold to science and to civilisation as centres of learning and conservatories of the evidence concerning acquired knowledge. Museums should not only be made safe treasure-houses of science, but they should be what their name implies—temples of study—perpetually open to all investigators.

The claims of science upon geological organisations cannot be discussed at length here, but because the ratio of power for the advancement or retardation of science possessed by such organisations is so much greater than that of individuals working independently, it is desirable to make this brief reference to them. That power increases also with the ratio of the

extent of the organisation, and it is largely centred in the director. His responsibility, especially if his organisation is a large one, is peculiar, and, to himself, of an unfortunate character. That is, while all, or nearly all, the advancement of science that may be accomplished by the organisation is the work of his subordinates, retardation, if it should occur, is mainly due to his failure to require that each branch of investigation should be prosecuted in accord with all others, and the case would be little less than disastrous should he himself favour *ex parte* methods, or fail to require a symmetrical development of the work in his charge. The claims of science upon geological organisations are therefore really claims upon their directors, and they are more responsible than any other class of persons for the preservation of the integrity of geological science.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

AT a meeting of the Council of University College, Dundee, last week, it was announced that the trustees of the late Miss Margaret Harris had allocated a number of securities, valued at nearly £14,000, to establish a chair of Physics in the College, as recommended by the University Commissioners. The Council resolved to institute immediately a chair of Natural Philosophy; and an appointment will be made before the beginning of next session. Hitherto the classes of Mathematics and Physics have been combined. The salary will be £400 with share of the fees.

THE invaluable *Record* of technical and secondary education continues, in the quarterly number just issued, the review of the work done by the Technical Education Committees of the English County Councils, commenced in the preceding issue. A summary is also given of the work of the Scotch County Councils, from which it appears that, out of a total of thirty-three County Councils, twenty-four are devoting the whole, and seven a part, of their grants to educational purposes, while two counties are applying the whole of the fund to the relief of the rates. Out of a total sum of £25,157 distributed among the County Councils of Scotland, £22,491 was devoted to education in the year 1893-94. Mr. P. J. Hartog contributes to the *Record* an illustrated description of the Owens College, Manchester.

THE Town Trustees of Sheffield have (says the *Athenæum*) voted a sum of £10,000 towards the endowment of Firth College, with a view to enabling the authorities to affiliate it to Victoria University. The actual endowment of the College is £23,000, in addition to its income of £1200 from the State and £800 from the Corporation. It is understood that a total of £50,000 would be sufficient, but no more than sufficient, for the purpose of affiliation. A further sum of £5000 has been conditionally promised by Sir Henry Stephenson, and a public appeal is contemplated for the remaining £12,000.

SCIENTIFIC SERIALS.

The Quarterly Journal of Microscopical Science for March 1895 contains:—On the variation of the tetraculocysts of *Aurelia aurita*, by Edward T. Brown. (Plate 25.) Of 359 Ephyrae collected in 1893, 22·6 per cent. were abnormal in possessing more or less than eight tetraculocysts; and of 1156 collected in 1894, nearly the same percentage, 20·9 was obtained. Of 383 adult Aurelia collected in 1894, 22·8 per cent. were abnormal.—On the structure of *Vermiculatus pilosus*, by E. S. Goodrich, gives a detailed account of this interesting Oligochæte, found near Weymouth in 1892. (Plates 26-28.)—On the mouth parts of the Cypris stage of Balanus, by Theo. T. Groom. (Plate 29.) "It may be regarded as tolerably certain that: (1) The antennæ of the Nauplius become definitely lost with the moult resulting in the production of the Cypris stage. (2) The biramous mandibles of the Nauplius become reduced at the same time to the small mandibles, the ramus being probably preserved in the form of the small palp. (3) The first pair of maxillæ arise behind the mandibles, and at a later date, as a small pair of foliaceous appendages. (4) The second pair of maxillæ arise still later, just in front of the first pair of thoracic legs (cirri)."—A study of Coccidia met with in mice, by J. Jackson Clarke. (Plate 30.)—Observations on various Sporozoa, by the same. (Plates 31-33.)—Revision of the genera and species of the