

or of the Confoco-ellipsoidal structure of the shells of the Foraminifera), which remained infructuous in the hands of its distinguished author, has served to set in motion a train of thought and propagated an impulse which have led to a complete revolution in the whole aspect of modern analysis, and will continue to be felt until Mathematics are forgotten and British Associations meet no more.

J. J. SYLVESTER

TECHNICAL EDUCATION

MANCHESTER at all events is beginning to be alive to the present situation, and at a meeting on the 18th inst., the following document, expressing the views of the Council of the Society of Arts, was read.

1. The Council of the Society of Arts have received a communication from Owens College Extension Committee, Manchester, asking their co-operation in the extension of technical education, or, more properly, Scientific Instruction; and it affords them much pleasure to do whatever lies in their power to advance this important national object. With this view, the Council have invited the members of the Society, and especially those resident in the locality, as well as the authorities of Owens College, to meet them in conference on the subject, to discuss the best means by which scientific instruction may be promoted, and to establish an organisation which will keep an influence at work to accomplish what is so urgently needed.

2. The necessity and importance of improved scientific instruction for the people of the United Kingdom, in order that they may be placed in a favourable position in the race of industrial competition with other nations, has, for some time past, been forced upon the notice of the Society of Arts, whose chartered objects are the Promotion of Arts, Manufactures, and Commerce.

3. The great international displays of industry in 1851, 1855, 1862, and 1867, have shown unmistakably that, if this country is to maintain her position as a commercial and manufacturing power, the people (and in this term are comprehended not only artisans, but also persons of higher position in the social scale) must have at their command the means of education improved in its general character, and embracing, if not based upon, science to a far greater extent than has hitherto been the case. The official jury reports at all the exhibitions abound in declarations of this character, and the country can no longer afford to ignore the fact, but must earnestly set to work to bring about a change. These reports, as well as those of the artisans who were sent to the Paris Exhibition of 1867 by the Society, one and all point out the great educational facilities which are available for all classes, and especially the artisan class, upon the Continent.

4. The Council are of opinion that existing schools and colleges, where science has hitherto been all but excluded, should adopt some means for its being taught; and that where such teaching already exists, measures should be taken for extending the usefulness of the institutions, and rendering them more easy of access to the great body of the people; whilst in localities where no such facilities exist, means should be taken to secure their foundation. The localities must themselves stir in this reform, and their efforts should be aided by pecuniary assistance and countenance by the State.

5. The nation must set itself earnestly to work to bring about the sought-for change in the education of the people. The evils have been so often pointed out, that it is unnecessary to enter into detail; our duty is to supply the remedy. This the Council believe to be by the localities setting themselves heartily to work, and when they have shown themselves in earnest by raising funds and organising establishments for the teaching of science, they should be entitled, as of right, to aid from the State.

6. In order, however, that such establishments, colleges, or schools should be of value to the mass of the people, so that they can take advantage of the facilities which would then be offered to them, it is absolutely necessary that elementary education, commonly known as primary education, should be extended far more widely than at present. To an ignorant population the establishment of colleges and schools for the teaching of science will be of little avail, and unless the blessings of an ordinary elementary education, *i.e.*, reading, writing, and arith-

metic, at least, can be more diffused, so as to place our people on a par with those of Switzerland, Prussia, Saxony, &c., the attempt to extend the teaching of science will be in vain. Again, not only must we have improved elementary education, but these elements must themselves be taught by improved methods and organisation, so that less time may be occupied in acquiring them, thus leaving free for the learning of elementary science some of those years which are now unnecessarily taken up in mastering the mere rudiments of knowledge. Abroad it is the custom of the State only to deal with this and many other matters of public concern, but such is not the case here. The Council do not recommend State interference as of choice, but of necessity. This work of education must be done, and will have to be done, wholly by Government, if not otherwise. Experience proves that it can be done by a combination of voluntary efforts with Government aid, as in the existing system of primary education, and in the instruction aided by the Science and Art Department. The Council think that the work is to be done in part nationally, in part voluntarily, but not upon a haphazard system.

7. Adam Smith, the earliest, and, perhaps, the first English writer on political economy, as well as Mr. J. Stuart Mill, its present most able exponent, recommend scientific instruction as profitable to the nation. Her Majesty's Government must not plead economy as an excuse, for the highest and wisest economy comes out of wise expenditure.

8. The Council believe that this is the feeling of the country, which the Government will regard with respectful attention. Government must be urged to co-operate with Owens College and other bodies, either existing or to be established. Parliamentary grants are now made to the old universities of England and Scotland, and to the Queen's Colleges in Ireland, and there is no reason why the same principle should not be extended, and grants made to modern educational establishments in the great centres of industry. The Council are of opinion that a Government resulting from a wide representation of the whole people ought adequately to represent the highest intelligence and aspirations of that people for improvement, and not limit its responsibility and its labours to matters of police. There can be no more profitable investment of national capital drawn from taxes paid by the whole nation, than in promoting the best education among all classes of the people, and the widest extension of sound knowledge, on which the Arts, Manufactures, and Commerce of a kingdom rest.

At the meeting, the following resolution, proposed by Professor Jack, was carried unanimously:—

“That the best interests of the country demand the establishment of a complete system of primary education, the extension of the system of science classes under a responsible department of the Government, and under a definite plan, and especially the establishment of Science Colleges in the principal industrial centres of the United Kingdom: and such colleges ought to be established and maintained partly by local efforts, and partly by liberal assistance from the State; and existing institutions such as Owens College ought to be made available for the purpose.”

For the present, we content ourselves with chronicling these facts, and calling upon other centres of industry, such as Birmingham, to help to bring the pressure of public opinion to bear upon the members of the Government, who, perhaps, more than anyone else, require to be taught the vital importance of technical education to the future national life.

WHENCE COME METEORITES?

IN examining a mass of meteoric iron found in the Cordillera of Deesa (Chili), M. Stanislas Meunier, of the Museum of Natural History in Paris, has discovered evidences of an unexpected relationship between this iron and two meteorites fallen at a great distance from Chili; viz. a mass of iron found at Caille (Alpes Maritimes), and a stone which fell at Sétif (Algeria) June 9, 1867.

The meteorite of Deesa is a mixture of these two rocks: it is composed of iron which is identical with that of Caille, injected in a state of fusion into a stone which is identical with that of Sétif. The iron of Deesa is thus evidently an eruptive rock, and it is the first hitherto