

turbines included) do not work so economically when running much below the power for which they are designed. For the long periods on which these boats are simply cruising about, the coal consumed is only that of the two small triple compound reciprocating engines, the steam turbines not being utilised, thus reducing their "cruising" coal consumption to a minimum which, when running at full speed, is only increased by the low consumption derived from the use of the steam turbine.

The marine steam turbine, forming, as it does, "one of the most striking developments in the history of marine engineering," is largely adopted by private enterprise; but, as *Engineering* points out, "it is a little surprising that at present no vessel is in progress fitted with turbine machinery and built for the Royal Navy."

MECHANICAL VENTILATORS FOR MINES.¹

THIS report is the outcome of a large number of experiments conducted under the directions of a strong committee of eminent mining engineers. Its object was to obtain exact information concerning the relative efficiencies of various ventilating fans. In order to make the comparisons of real value, the experiments were restricted to collieries provided with two fans, each of which could be used in turn; the conditions were therefore identical in each case. Only three kinds of fans were compared, viz., the Guibal, the Schiele and the Waddle, with the result that the Guibal decidedly carried off the palm. But, as pointed out in the report, the conclusions arrived at are not beyond criticism, because the efficiencies were determined in each case by taking the ratio between the so-called "useful effect in air" and the indicated horse-power of the steam-engine used for driving the fan, without knowing how much power was consumed in overcoming the inherent resistance of the engine. Some experiments made in Belgium in 1899 were more satisfactory, because this point was taken into consideration. Here it was found that the Rateau fan had a decidedly higher mechanical efficiency than the Guibal.

The Committee has adhered to Murgue's time-honoured method of comparing the resistance of any given mine to that of an orifice in a thin plate. No doubt the idea of an imaginary "equivalent orifice" has served a useful purpose, but a simpler and plainer way of expressing the amount of resistance is that advocated by Hanarte; he reckons the resistance of a mine by the horse-power required to overcome it, and there is much to be said in favour of his proposal to classify mines according to this system.

Long pages crowded with figures bear testimony to the pains taken by the Committee to fulfil its task, and it is interesting to find that its observations afford a verification of the two fundamental formulæ of centrifugal ventilators. Mr. Walton Brown, the indefatigable secretary of the Institution of Mining Engineers, may be fairly congratulated upon the useful report which he has drawn up.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The 233rd meeting of the Junior Scientific Club was held on February 21. Dr. Hedin, of the Jenner Institute of Preventive Medicine, read a paper, chiefly an account of his recent researches, on "The Proteolytic Enzymes of the Animal Body."

MR. T. P. KENT, scholar of Christ Church, Oxford, and assistant master at Cranleigh School, Surrey, has been appointed professor of mathematics at Rondebosch College, Cape Town.

IN view of the date appointed for the coronation of their Majesties, the day examinations of the Board of Education, South Kensington, arranged to be held during the week ending June 28, will be held during the week ending July 5.

AN article on the use of ordnance survey maps in teaching geography, contributed by Sir Archibald Geikie to the February number of the *Geographical Teacher*, directs attention to the invaluable aid to the study of geography which these maps

¹ Report of the Committee of the North of England Institute of Mining and Mechanical Engineers, and the Midland Institute of Mining, Civil and Mechanical Engineers. By Mrs. M. Walton Brown. *Transactions of the Institution of Mining Engineers* (vol. xvii. pp. 96+ xvii plates).

afford. In spite of the fact that the maps are adapted to instruction in the most elementary or the most advanced stages of geography, and are so cheap, they are but rarely used, and the geographical lesson is usually conducted in the unintelligent way with which we are all familiar. Hung upon the wall of the schoolroom, the maps encourage the study of home geography in the pupils, and give them facility in map-reading. Attention may then be directed to the information the maps contain as to the configuration or topographical features of the land, the system of contouring, and the method of plotting profiles or sections across a piece of ground. The teacher can then pass to the intelligent consideration of the causes of the varying physical features of the land, using for this purpose the maps of the Geological Survey, or can derive lessons on the influence of physical features upon the history and progress of the inhabitants of a country. Many other similar uses can be made of the maps, and by adopting them geography may be made a scientific study instead of a jumble of words, figures and phrases. It is to be hoped that Sir Archibald Geikie's paper will be read by every teacher who desires to make the geography lesson a means of cultivating the intelligence. Another paper in the *Geographical Teacher* which will assist this object is by Mr. A. M. Davies, on the geography of Greater London. Mr. James Bryce's address on the importance of geography in education, delivered at the recent annual meeting of the Geographical Association and already noticed (p. 284), appears in the same number of the magazine.

A REPORT of the discussion on reform in the teaching of mathematics, which took place at the meeting of the Mathematical Association on January 18, is published in the *Mathematical Gazette*. Prof. A. Lodge opened the discussion with a paper in which he advocated the introduction of a course of geometry similar to that taken in French schools. The chief points in the French text-books which he desired to see introduced are:—(1) The more orderly arrangement of propositions; (2) the entire separation of theorems from problems of construction, hypothetical constructions being used in proving a theorem; (3) the closer association of a proposition and its converse when both are true; (4) the adoption of arithmetical notions and algebraic processes; (5) the early introduction of simple loci; (6) insistence on accurate figures drawn by accurate and practical processes; (7) practice in exercises from the very beginning. In the subsequent discussion, Prof. G. M. Minchin, F.R.S., gave instances of the failure of boys to understand Euclid's language and methods, and also described desirable reforms in the teaching and nomenclature of dynamics and hydrostatics. The discussion was, however, mainly concerned with the teaching of geometry, and the general opinion of the speakers was that demonstrative geometry should be preceded by a course of work with ruler, compasses and protractor, in which simple measurements and constructions formed the chief part. This has been done for many years in Scottish schools and also in some elementary schools in England. One speaker expressed his surprise at the amount of work that could be done with a pencil, ruler, a pair of scissors and a piece of paper, and others referred to the value of illustrations of geometrical truths obtained with similar materials. It seems, however, to have been overlooked that this work has long been part of kindergarten teaching.

SCIENTIFIC SERIAL.

American Journal of Science, February.—On geometric sequences of the coronas of cloudy condensation, and on the contrast of axial and coronal colours, by C. Barus.—On a new occurrence of sperrylite, by H. L. Wells and S. L. Penfield. A minute quantity of sperrylite, platinum arsenide, was found in a specimen of platiniferous copper ore from the Rambler Mine, Medicine Bow Mountains. Platinum is found in ores from all parts of the mine in quantities varying from '06 to 1.4 ounces per ton.—A cosmic cycle, by F. W. Very.—Studies of Eocene mammalia in the Marsh collection, Peabody Museum, by J. L. Wortman. The present instalment deals chiefly with *Patriofelis ferax*, and contains a detailed criticism of the views recently expressed by H. F. Osborn.—On a miniature anemometer for stationary sound waves, by B. Davis. By sufficiently reducing the dimensions of the cups and vanes in the ordinary anemometer, it was found possible to determine the relation between the amplitude of vibration and the rate of rotation in