

Notes and Clippings.

SCIENCE AT SOUTH KENSINGTON.

The *English Mechanic* is very bitter against the clique which runs the South Kensington Scientific Departments. It says:—The general public, whose ideas of science teaching at Kensington are mainly derived from the newspaper reports of the field-days at that remarkable institution, would probably experience a feeling compounded of surprise and indignation were they permitted even the briefest peep behind the scenes, at the wonderful Brompton focus of jobbery and place-making. To read the fulsome way in which "the butter-boat" is passed between Mr. Mundella and certain of the most prominent and leading spirits among the vast staff of hangers-on of the "Department," could scarcely fail to impress the conviction upon the un instructed outsider that great and valuable educational work in science was being performed at Brompton, at a relatively insignificant national cost; and that the oft-reiterated complaint that the British artificer was woefully behind his Continental confrère, was in a very fair way, indeed, of being speedily remedied. Now, *in limine*, the total amount distributed in the shape of grants to successful candidates, may be taken roughly to amount to £40,000; a sum which the nation need scarcely grudge, were it devoted to a legitimate end. The total annual cost of the Science and Art Department, however, is £337,181, and if we halve the sum devoted to these subjects jointly, it needs but very rudimentary arithmetical achievements, indeed, to deduce the fact that three-quarters of the sum annually voted by the state for teaching sciences is swallowed up by the staff of leeches who fatten on this most singularly constituted establishment. But, even then, do we get our "hapor'th of bread" in connection with this "intolerable quantity of sack?" We wot not. Artificers proper are extremely scarce among the competitors; and such subject as machine construction and applied mechanics are taken up by a totally insignificant proportion of the competitors. Pupil-teachers are the people who figure most conspicuously among the candidates, for a reason which must be at once apparent to all school managers and others having anything to do with the administration of the Education Code. To meet this state of things, there has arisen a wretched system of cramming from a series of textbooks (many of them compiled by members of the overgrown and overpaid staff at Brompton themselves), by the aid of which a considerable percentage of candidates contrive to pass in various fancy subjects in the elementary stage. Should one of them manage, by dint of more than usually energetic cram, to pass in the advanced stage, he forthwith receives a certificate entitling him to teach the subject in which he has gone out; and so hordes of scientifically blind teachers of the blind are scattered broadcast over the country. We cannot better illustrate the kind of information communicated by this most faulty system than by quoting a series of actual answers given by various students in the new-fangled subject of "Physiography"—a subject expressly invented to create a berth at Brompton for one of the creatures of the department. We have received them direct from a quondam examiner, and pledge ourselves as to their absolutely genuine character and literal transcription. (1.) "The negro race have a very thick skull, at which the back of the head goes quite straight up to the forehead. Their hair is of a black, woolly color, and their perplexion (*sic*) is rather black. The part of the world in which they live is India. The negroes are very strong, and if you wanted to kill one of them, the best place to hit them would be in the body. The tenderest place of the negro is the back of the leg, just below the knee." (2.) "Climates are those vast plains which are very cold and frosty." (3.) "On the west coast of Europe the climate is very cold compared with the east of America. This is owing in some measure, to the Ural Mountains." (4.) "The chief rainless districts are Europe, Asia and Africa. They are caused by the sun shining so much on the countries, and therefore draws up more water." (5.) "During an eruption the crater gradually gets lifted up until it reaches the top and flows over the side of the volcano." (6.) "A great circle must be something that we cannot see the end of, like a rainbow, which when it is seen in the heavens appears to reach from one end of the sky to the other." (7.) "A great circle is called an oblate spheroid." (8.) "The equator is the line showing the centre of the Earth," and (9.) *Finis coronat opus*. "The increase of civilization of the British Island is rectified by the many indentations in the coast, which proves the commercial pursuits

carried out; for the ships coming in gradually wear the coast away. Africa has the least indentation in its coast, and is the most degraded." Such are, *verbatim et literatim*, a few of the replies given at some tolerably recent Science (?) Examinations at South Kensington. We do not, of course, pretend that those who penned them passed, even in the elementary stage. Our purpose in quoting them here is to invite a careful perusal of them in connection with that of certain notorious textbooks, in order that the reader may see for himself just how and where such astonishing blundering has had its origin; and exactly how the miserable examiners have muddled up the ill-digested mass of facts which have been crammed into them from these compilations. Such a comparison will show that, in a large proportion of cases, the very words of the textbooks have only been sufficiently distorted or misapplied to just make nonsense of the answer. This, then, is the outcome of the system of cram and sham, for which the British nation is annually called up to pay such an exorbitant sum. Even did the cost of the staff bear some reasonable proportion to that of the actual grant, a system which encouraged such a form of scientific education (Heaven save the mark!) as all this indicates, must stand self-condemned. Mr. Mundella may flatter Professor Huxley, Professor Huxley may flatter Colonel Donelly, and the gallant Colonel may "pass it on" to Mr. Mundella again; but the day must come when all this sham will be found out. Then will an indignant public learn that all these examinations, certificates, scholarships, et id genus omne, are but an excuse, cloak, and blind for the maintenance of an enormous horde of overpaid hangers-on and parasites at Brompton; and that if a clean sweep were made to-night of the entire party, British science could not fail to be in an infinitely sounder, healthier, and more prosperous condition for it.

BRENNAN'S TORPEDO.—This torpedo has been in process of manufacture and improvement for some considerable time at Melbourne, partly under the auspices and with the assistance of the Victorian Government. The invention has been patented in England and the Colonies, but it was not considered politic to exhibit it at the late Melbourne Exhibition, pending the negotiations with the British Government. It is difficult to convey a clear idea of such a machine as a locomotive torpedo to the general reader without the aid of sketches; but compared with the Whitehead, Fiume, or the Woolwich Royal Laboratory patterns, the Brennan is simplicity itself. Its motive power is not compressed air, neither is it contained in the body of the torpedo. To propel the weapon through the water at a speed of from 15 knots to 20 knots an hour for 1,000 yards, a separate engine, or at least a special connection with an existing one, is necessary. This engine drives two drums, about 3 feet in diameter, with a velocity at their peripheries of 100 feet per second. Their duty is to wind in two fine steel wires No. 18 gauge, the same as used in the deep-sea sounding apparatus of Sir William Thomson. The rapid uncoiling of these wires from two small corresponding reels in the belly of the fish imparts to them, as may readily be conceived, an extremely high velocity. The reels are connected with the shafts of the two propellers which drive the torpedo through the water. The propellers work, as has long been known to be necessary to insure straight running, in opposite directions and both in one line, the shaft of one being hollow and containing the shaft of the other. At first sight it would seem as if hauling a torpedo backward by two wires was a sufficiently-curious way of speeding it "full speed ahead" but it is found in practice that the amount of "drag" is so small, as compared with the power utilized in spinning the reels that give motion to the propellers, that it may be left out of calculation altogether. The steering-gear of the Brennan is a most ingenious contrivance, whereby the relative velocities of the two driving drums, and consequently of the two propellers, can be varied at any moment. The perpendicular rudder, which is marvellously sensitive, is reacted on by the screws, and in this way the torpedo may be made to follow as tortuous a path as a figure-skater. The course the torpedo is taking is indicated to the operator by a slight steel telescopic mast carrying a pennon, which, when not in use, is folded along the back of the torpedo.

SULPHUR and grease have a cooling tendency upon hot bearings. This is probably because the fine metallic dust formed by the hot journal combines with the sulphur to form a greasy sulphide.