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which he follows by a treatment of river and canal engineering and irrigation works, dock works, maritime engineering and sanitary engineering. An admirably compiled index is not the least valuable feature of the book.

**PRINCIPLES OF WESTERN CIVILIZATION.** By Benjamin Kidd. New York: The Macmillan Company. 1902. 12mo. Pp. 538.

The author's book, "The Control of the Tropics," was a very much talked of work a few years ago, and his present contribution to a much-neglected corner of literature will be much appreciated. It shows the work of a deep thinker.

**GRADED PHYSICAL EXERCISE.** By Bertha Louise Colburn. New York: Edgar S. Werner Publishing and Supply Company. 16mo. Pp. 389. Price \$1.

This is an admirable book, dealing with a most important subject. The illustrations are excellent, and the whole scheme is a long step in advance of anything which has been done heretofore.

**THE SCENERY OF ENGLAND AND THE CAUSES TO WHICH IT IS DUE.** By the Rt. Hon. Lord Avebury. New York: The Macmillan Company. 1902. 8vo. Pp. 532. Price \$2.50.

It is rare that we find a book dealing with a geological subject published in such admirable form. The book is excellent, and deals with a subject which will interest all who care for natural science. It is elaborately illustrated by well-executed engravings and diagrams.

**Notes and Queries.**

**HINTS TO CORRESPONDENTS.**

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

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(8624) W. A. H. asks: We have frequently heavy rainstorms with much lightning and very little thunder. We have again heavy rainstorms with vivid lightning and deafening crashes of thunder. Will you kindly explain the causes of these two phenomena? A. We have no especial explanation to advance why at any one time the thunder re-echoes loud and at another time it does not. The difference is perhaps due to the density of the clouds. A dense cloud would reflect the sound to the earth and confine it more than a thin cloud. When the air is much disturbed and mixed with masses of varying density near each other, sounds travel with difficulty and soon die out. This is usually the case in a thunder-storm to such an extent that the thunder is rarely heard twenty miles away from its starting point. Such considerations may help to explain the difference you mention.

(8625) C. B. H. asks: 1. How does the oil on the stormy water produce a smooth surface? Is it surface tension of the oil, or does it prevent the wind taking hold of the crest? A. Barker in his textbook on physics says: "Besides the surface tension of liquids, there is another property possessed by their surfaces, called surface viscosity, which is independent of surface tension. Owing to the much greater viscosity of the superficial film of liquids over that of the interior, this film is very hard to break. Soap solution has high surface viscosity and low surface tension, and hence is easily blown into bubbles. To a like increase of superficial viscosity and decrease of surface tension is due the stilling effect of oil upon a rough sea." 2. I am making the little electro-plating dynamo described in "Experimental Science," page 494. I would like to know: What voltage it gives at what speed? What is its internal resistance? How should it be wound to give 9 or 10 volts? What would its internal resistance then be? To what extent can the voltage and current be controlled (with as little loss of power as possible) by using a rheostat as mentioned on page 497? A. We regret that we are unable to give you answers to the questions you ask regarding the little electro-plating dynamo on page 494 of "Experimental Science." The machine has been built and has successfully plated small articles. Further we do not know. 3. Is the result worth the time and trouble in making carbon rods and plates as described on page 705, "Experimental Science"? A. It is not worth while for the amateur to make carbons. They can be bought very cheap, and cannot be made successfully without expensive machinery for pressing them before baking.

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