

The Design of Simple Roof Trusses in Wood and Steel.

By M. A. Howe, C.E. Pp. viii + 129. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1902.) Price 2.00 dollars.

THIS little book is intended to serve the purposes of students in mechanical and electrical engineering, who desire to have some knowledge of the methods of design adopted in civil engineering, and hence the examples chosen are two very simple forms of roof trusses.

The first two chapters give a brief outline of the general principles on which are based the graphical determination of the stresses in the various parts of a roof truss; then follows a carefully written chapter on the strength of the various materials used in roof work in tension, compression, cross-bending and shear. The author then works out in complete detail the design of a 60-foot-span wooden roof truss, and of a 60-foot-span steel roof truss—one particularly good feature of this part of the book is the extreme care which has been shown in the explanation of the design of the various joints needed in such roof trusses.

There are three well-drawn plates to illustrate these two roofs and a series of seventeen tables, including a most useful set giving moments of inertia, radii of gyration, &c., for various rolled sections commonly used in the struts of roof trusses.

We can recommend the book as one likely to be of much use to both teacher and student in classes for the study of civil engineering design.

Stereotomy. By A. W. French, C.E., and H. C. Ives, C.E. Pp. iv + 115. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1902.) Price 10s. 6d.

THIS is another text-book for the student in civil engineering, and treats of masonry work, mainly in arches and domes.

The two first chapters give a brief account of the various stones used for building purposes, and their physical characteristics, and of the tools used in quarrying and cutting the blocks into their finished forms. The third chapter treats of plane-sided structures, such as bridge piers and abutments, with several practical examples illustrated by plates. Chapter iv. deals with structures containing developable surfaces, and includes a detailed treatment of the masonry arch; the geometry of the arch is explained, and the preparation of the working drawings for use by the stone mason, and also the methods employed in dressing the stones. The oblique or skew arch, difficult both in its geometry and in its constructional details, is worked out in a separate chapter, with several fine illustrative plates.

As the twenty-two plates which illustrate the text are drawn from actual masonry structures, such as the Worcester City Hall, the Trenton railway bridge, &c., they will prove extremely useful to the student, more especially as there are few recent text-books which deal at all fully with this branch of the art of the civil engineer.

Round the Horn before the Mast. By A. Basil Lubbock. Pp. x + 375. (London: John Murray, 1902.) Price 8s. net.

THESE experiences of a public school man, who at San Francisco turned himself into an ordinary seaman and "signed on for two pounds a month for a passage round the Horn, calling at Queenstown for orders, either for the British Isles or Continent," will interest most boys. Probably few adult readers will get to the end of the volume, but Mr. Lubbock can congratulate himself that most boys will read all he has written and pronounce it "good."

NO. 1741, VOL. 67]

LETTERS TO THE EDITOR.

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Radio-activity of Ordinary Materials.

I SHOULD like to say a few words in answer to Prof. Armstrong's letter, in which he suggests that the effects observed by Prof. McClennam and myself are not due to radio-activity, but to chemical changes at the surface of the substances experimented upon. In speaking of the radio-activity of ordinary materials, I mean that they show effects differing only in degree from those exhibited by uranium and radium. These effects, as observed experimentally, are as follows:—

(1) There is a leakage of electricity from a charged body in the neighbourhood. This leakage is proportional to the E.M.F. for small E.M.F.'s, but for large ones independent of it.

(2) The effect varies with the pressure of the air, being for small pressures proportional to the pressure, and for large pressures independent of it, when the E.M.F. is sufficient.

(3) The rate of leak is the same for positive electricity as for negative.

(4) The rate of leak does not depend on the temperature.

(5) When other gases are substituted for air, the leak is nearly proportional to the density of the gas, except in the case of hydrogen, which gives about one-eighth the effect that air does.

In every one of these points there is exact agreement of behaviour between uranium and the ordinary materials. On the other hand, I am not aware that any difference has been brought to light, except as to the magnitude of the effects. Until such a difference should appear, I think we may fairly, and without dogmatism, apply the maxim that similar effects are due to similar causes. In other words, we may conclude that the other substances, like uranium, are radio-active.

R. J. STRUTT.

A Case of Pseudo-mimicry.

In Campbell Island, south of New Zealand, the breeze-fly (*Heleophilus campbellicus*), one of the Syrphidae, so closely resembles a blow-fly (*Calliphora eudypti*) that when, in 1901, I captured a specimen of the first, which is rare, I thought it was the blow-fly, which is common; and it was not until I was transferring my captures to boxes that I found out my mistake.

C. eudypti has the abdomen metallic bronzy green, with a dark thorax, and black and tawny legs. *H. campbellicus* has also a metallic bronzy green abdomen, a dark thorax, and black and tawny legs. There is a difference in the stripes on the thorax, but they are obscure. In size the two insects are the same.

Now in any other locality this resemblance could be put down to mimicry. The blow-fly is common and offensive. The breeze-fly is rare and feeds on flowers. Everything favours this explanation except that in Campbell Island there are no insect-eating birds and no lizards, and consequently mimicry would be useless. Evidently, in this case the resemblance is only a coincidence and has no meaning.

F. W. HUITON.

Museum, Christchurch, N.Z., January.

ACCIDENTAL resemblances between insects are to be expected. The immense number of species and the necessary limitation in the variety of colours and patterns must lead to coincidences, as, I believe, was first pointed out by Mr. F. E. Beddard in his book on "Animal Coloration." The coincidences would, of course, be relatively more numerous when the patterns are simple. Accidental resemblances being independent of locality and of an origin based upon utility, it follows that a very small proportion of the total number of cases are to be expected to occur under conditions which are the characteristic concomitants of true mimetic resemblance.