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During the absence in England of the Editor, Professor Henry T. Bovey, communications, &c., relating to the Editorial Department should be addressed to R. W. BOODLE, 21 McGill College Avenue, Montreal.

The Editor does not hold himself responsible for opinions expressed by his correspondents.

No notice will be taken of anonymous communications.

NEW BOOK.

The Materials of Engineering. Part II. "Iron and Steel," by Robert H. Thurston, A.M., C.E. (New York, John Wiley & Sons, 1883.)

The second part of Mr. Thurston's "Materials of Engineering" proves to be, as the first led us to expect, a work of the greatest value to all engineers and students busied in this department of science. It is clearly printed and fully illustrated with cuts of different processes, machines, &c. The work serves as an admirable compendium of information upon this branch of the materials of engineers. Thus after an opening chapter upon the qualities of metals of somewhat an elementary character, and a sketch of the history and principles of metallurgic work, the student is led on to iron and steel in manufacture, and to suggestive remarks upon the effects of time and temperature upon the metals. The work concludes with a practical chapter upon Specification, Tests and Inspection. This is in every way a good book, and we are glad to be able to recommend it highly to the public. The author not only makes constant references to the works of recognized authorities like Weyrauch, Rankine, Molesworth, Egleston, &c., but has made excellent use of the Transactions of different engineering and scientific societies, chiefly American and French. This we consider to be an excellent point. Nowhere is improvement in detail and manipulation more constant than among engineers, and to keep abreast of the times it is necessary to read widely among the miscellaneous periodicals, registering recent results that have not yet found their way into the works of recognized authorities. With regard to iron and steel, this task has been admirably done by Mr. Thurston.

Upon Factors of Safety, p. 340, &c., Mr. Thurston has some capital remarks to which we would refer our readers. By way of illustration, we quote the following paragraph from them: "The factors of safety adopted for iron and steel are lower than those usually admissible for construction in other materials, in

consequence of the fact that the elastic limit and the elastic resiliance, or shock-resisting power of the former seem to increase, up to a limit, with strain; while the latter gradually yield under comparatively low stresses, as will be seen hereafter. In common practice, the factor of safety covers not only risks of injury by accidental excessive stresses, but deterioration with time, uncertainty as the character of uninspected material and sometimes equally great uncertainty as to the absolute correctness of the formulas and the constants used in the calculations. As inspection becomes more efficient and trustworthy; as our knowledge of the effect of prolonged and of intermitted stress becomes more certain and complete; as our formulas are improved and rationalized, and as their empirically determined constants are more exactly obtained, the factor of safety is gradually reduced, and will finally become a minimum when the engineer acquires the ability to assume with confidence the conditions to be estimated upon, and to say with precision how his materials will continuously carry their loads."

We reserve some thoughts and criticisms suggested by the work before us to a future Number.

THE HEAT OF THE SUN.

BY ERNEST H. SOOK, B.SC. (LOND.), F.C.S.

(Concluded from page 101.)

With such a preliminary assertion Dr. Siemens proceeds to formulate the fundamental assumption that all space is filled with highly rarefied gaseous bodies, including hydrogen, oxygen, nitrogen, carbon, and their compounds. The planetary bodies scattered in such an atmosphere would attract to themselves atmospheres varying in density, according to the varying density of the planet. But this attraction would be, to a certain extent, selective, and consequently, such atmospheres would consist of the heavier and, therefore, less diffusible gases, while the lighter would remain in space. In space, therefore, there would be a vast preponderance of hydrogen, and the higher hydrocarbons. But again, the planetary system as a whole, will attract the rarefied gases existing in stellar space, thus we shall have existing in space what may be called three classes of atmospheres: inter-stellar, inter-