

The Ventilation, Heating, and Management of Churches and Public Buildings. By J. W. Thomas. Pp. vi+140. (London: Longmans and Co., 1903.) Price 2s. 6d.

THIS book is addressed chiefly to the architects, managers and caretakers of buildings, and its opening chapter deals with the physical principles bearing on ventilation. An interesting account is given of the author's observations on alternating air currents and their effects. Some passages are, however, very obscure, as, for instance, when one reads of "the electrical conditions due to the sudden expansion of the air."

In discussing the effects of wind on ventilation, in the second chapter, the writer makes the cryptic statement that "the friction caused by the wind passing over buildings is so great that it is scarcely possible to demonstrate it accurately," and later on he speaks of the air in a room as being strained "to its utmost limit of tension." The next chapter is on the effects of moist air on ventilation, and here the author reaches a climax. In it we read of "rooms where persons are gathered who evolve sputae or other germs of infectious disease," and we are told that "when air is supersaturated with moisture it become heavier." It is a great pity that any writer should have so little sense of the responsibility of authorship as these extracts indicate.

The next chapter, dealing with air inlets and outlets, is disfigured by an obscure passage about carbonic acid being "held in suspension in a semi-dissolved condition" in air saturated with moisture. The actual state of the ventilation in typical buildings, and the methods to be employed in order to improve matters, are next treated. These portions will be found interesting and suggestive.

The remainder of the book is occupied by the discussion of different methods of ventilation, the ventilation of new buildings, and instructions for caretakers.

J. H. V.

Practical Exercises in Heat. By E. S. A. Robson, M.Sc. Pp. xii+187. (London: Macmillan and Co., Ltd., 1902.) Price 2s. 6d.

THIS useful little volume contains a description of one hundred and two experiments in heat, suitable for an ordinary laboratory course. It is divided into fourteen chapters, each of which comprises a set of classified and numbered experiments—an arrangement which should find favour with teachers of practical physics. At the end of each chapter is given a number of additional experimental exercises, mostly selected from examination papers of the London University. The descriptions are clear and concise, and the text is amply illustrated; the more elaborate experimental corrections are avoided, so as to allow the student to obtain a firm grasp of fundamental principles. The student who conscientiously works through this course should gain fairly accurate results, and, what is more important, a good general idea of the methods of experimental research. The first two chapters are devoted to measurements of temperature, and corrections of the mercury thermometer; these are followed by chapters on the expansion of solids and liquids. It may be noted, in passing, that, in experiment 22, p. 36, on the determination of the temperature at which water acquires its maximum density, the mercury placed in the bulb for the purpose of eliminating the expansion of the latter should have a volume equal to one-seventh of the internal volume of the bulb, not, as is stated, one-seventh of the volume of the glass composing the bulb. The expansion of gases, calorimetry, and change of state are treated in subsequent chapters. Chapters are devoted to electrical methods of measuring temperature, conduction, and radiation. The last chapter is occupied by experiments

relating to elementary thermodynamics, including the ratio of the specific heats of air and the value of J . It may be remarked that, though a rough determination of J may be effected by allowing lead shot to fall a number of times down a cardboard tube, and observing the rise of temperature produced, yet if mercury is substituted for the shot, as suggested on p. 155, no appreciable rise of temperature will be obtained, owing to the small viscosity of the mercury. In later editions, it is to be hoped that an account of Prof. Callendar's recently devised method of determining J will be described, since this is the only satisfactory determination which has so far been brought within the reach of the student who can spend but a limited time over an experiment. E. E.

"The Amateur Photographer" Library. Nos. 25 and 26. *Enlargements: their Production and Finish* (No. 25). By G. Rodwell Smith. Pp. xxiii + 130. Price 1s. *Bromide Printing* (No. 26). By Rev. F. C. Lambert, M.A. Pp. xxiii + 74. Price 1s. (London: Hazell, Watson and Viney, Ltd., 1902.)

THERE is no doubt that the photographer is well supplied with literature on his subject, and, as a rule, he is not loth to take advantage of this source of information, although he has to look about him for the book containing the particular kind of help he requires. There are, however, so many workers who do bromide contact printing and enlarge their negatives that these two small manuals on these special topics should prove of great service. The authors treat each manipulation separately, and explain them so that the amateur can easily follow the instructions. One excellent feature of both these books is that the illustrations, which are numerous, exhibit various types of under, correct and over-exposed prints or enlargements, prints from suitable and unsuitable negatives for enlarging, untouched and retouched prints, &c., which should aid the beginner in forming an early judgment on his own results. In addition to the actual routine of the manipulations required, many miscellaneous hints are given, such as obtaining a bromide print quickly from a wet negative, converting a bromide print into a line drawing, &c. Altogether, these manuals are well suited to acquaint amateurs with the nature and use of the materials employed in these processes.

Natural Law in Terrestrial Phenomena. By Wm. Digby, C.I.E., F.S.S., &c. Pp. xlv + 370. (London: W. Hutchinson & Co., 1902.) Price 6s.

THIS book deals with the theory, revived and amplified by Mr. Hugh Clements, which seeks the cause of all meteorological and of most volcanic phenomena in luni-solar attractions. The evidence which Mr. Digby adduces in support of Mr. Clements's theory is not convincing. In the early chapters, he shows how a number of gales and eruptions, more particularly the recent catastrophes in the West Indies, have occurred at times when the astronomical conditions were favourable to the production of high tides, but the important question of how often either of these two sets of phenomena may have occurred independently of the other is not discussed. The chapters on forecasting will probably attract most attention. Mr. Clements tells us that the earth, moon and sun occupy the same relative positions every 186 years, and that, therefore, identical weather conditions will prevail. Given trustworthy records extending over 186 years, forecasting becomes a mere matter of looking up records for corresponding days. Failing such records, we must compare days on which the astronomical conditions are as nearly alike as possible. In appendix iii., rules are given for allowing for the effect of small differences in the parallax, declination and times of transit of the sun and moon, on the height of the barometer, the