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ter four years of this, Mr. Matthews ceased to be Mayor, and Mr. Wheelwright gladly went back to private practice, leaving behind him an enviable reputation, a city architecture greatly improved by his incumbency, and a recommendation to abolish the "Architect Department," which was done by Mayor Curtis, Mr. Matthews's successor.

Certain important facts were exhibited by this Boston experience: that if the right appointment were made, a city's architectural work might be admirably and economically carried on in design, construction, and administration; that there was every likelihood that, in the long run, the right appointments would not be made; and that under the wrong ones the "Architect Department" was peculiarly apt for corruption, maladministration, and political abuses. If these things were not difficult to prophesy, the demonstration of them was irrefragable; and cities which are without the gift of prophecy may well learn from the demonstration.

The volume which now is handsomely issued by the Bates & Guild Co. is the first of two which are announced, and contains forty-three folio heliotype plates from school-buildings built for Boston by Mr. Wheelwright, with an introduction and a valuable essay on school-house architecture, by Prof. Chandler, and a commentary on the buildings, liberally illustrated in the text by plans and supplementary cuts. The buildings, all of quiet design, in a classic or Italian style, and of simple materials—brick, with a modest use of terracotta and cut stone—show how much character, dignity, and even elegance an able architect may secure with these slight means by straightforward, appropriate design, by skillful use of proportion and refinement of detail. Though of necessity pretty uniform in type of plan, they are models of good arrangement, according to the needs of school-houses as they are understood in this country. One wonders, as he looks them over, that the same architect should in four years have designed so many buildings for so nearly uniform uses, with so much variety and at such a level of excellence.

Prof. Chandler's essay on the planning and construction of school-houses is admirable—clear, practical, comprehensive, and judicious. He discusses in detail their arrangement, construction, lighting, heating, ventilation, hygiene, and furnishing, in the light of modern knowledge, and with the illustration of Mr. Wheelwright's large experience. We doubt if the English reader will find the subject so adequately treated elsewhere. We can hardly agree with Prof. Chandler when he repudiates that provision of the Boston laws which requires that school-houses shall be made incombustible throughout, still less when he urges that eighty pounds per foot is a sufficient allowance for live load on the floors, in buildings where, especially in the exhibition-rooms, the sudden surging of a large number of people is to be provided for. But we must praise his suggestions of economy in school-building, which could hardly be better supported than by this score of thoroughly built and well-designed examples, the cost of which, built in two, three, or even four stories, ranges from \$2.50 to \$3.50 per square foot of ground area, with only two exceptional cases where it rises to \$4.24 and \$3.82.

The execution of the volume, both plates and letter-press, is admirable in its kind—

as handsome as could be asked; our only criticism is that it is rather sumptuous for the occasion. The simple buildings look a little overdressed in so elaborate a toilet, and the book is too big and probably too costly to have the circulation it deserves. Both Mr. Wheelwright's designs and Prof. Chandler's essay are valuable enough to be freely distributed among architects and students. We would, therefore, suggest that the whole text, with its incorporated illustrations somewhat extended, would, if reprinted in quarto form, make a book which would be exceedingly useful and which ought to be widely sold.

*The New Psychology.* By E. W. Scripture, Director of the Yale Psychological Laboratory. [Contemporary Science Series.] Scribners. 8vo, pp. 500; 124 illustrations.

The present volume worthily fills its place in the highly modernistic series edited by Mr. Havelock Ellis. It consists in the main of a general account of all that is done in the psychological laboratories. We cannot say that it renders a satisfactory measure of justice to American work. The uninformed reader will gather that, except at Yale, the experimental psychology of this country does not rank very high, which is far from the truth. Considering how young the experimental science of the mind is, and that it is not of full-blooded experimental parentage, it is not surprising that, to a chemist or physicist, the psychological laboratories should not appear as marked by great experimental ability. It is probably a more significant fact that the results, after all, seem to be confined to a narrow department of the mind, although precisely what the significance of this fact may be it is too early to judge with confidence.

There is nothing at all in this book about cerebral physiology, except some words of exaggerated praise, accompanying the opinion that that study throws little light on psychology. The psychophysicists, however, can hardly afford to dispense with the aid of the cerebral physiologists, for it is a question whether both together have accomplished as much as Berkeley, Hartley, James Mill, Young, and the rest of the old associationists.

Apart from its account of psychology, this book does, in a sense, mark a stage in the growing importance of that science. Fechner's "Psychophysik," from which the science dates, was published in 1860 (a date Dr. Scripture ought not to have omitted); but the present general interest throughout the scientific world in the subject arose about 1888, when Dr. Stanley Hall's *Journal of Psychology* was established, and when Prof. James's expositions were beginning to attract attention. Yet, young as is the movement, in this volume psychology already begins to jostle astronomy from her throne, as that one of the sciences from which the logic of science is to be learned. Thirty years ago, when Herschel's "Outlines" was still in use in colleges, when Bertrand and others were still explaining to the general public how Copernicus, Tycho Brahe, Kepler, and Newton had laid the foundations of science, the ordinary student expected that it would be in the course of his study of astronomy that he would become acquainted with the methods of scientific discovery and with the precautions needed in applying them. But the first four chapters of this book—one-

sixth of the whole in space and about half its whole significance—are devoted to the general consideration of Observation, Statistics, Measurement, and Experimenting. This is in part due to Dr. Scripture's field of view being limited by a German horizon, and to a consequent confusion between psychology and logic, a science properly and in itself no more connected with psychics than with physics. Nevertheless, as well as the horoscope of twentieth-century science can be read, there are still much greater heights of importance to which psychology is destined to rise before its culmination; and its educational conjunction with the logic of science may be expected to become closer and closer.

The chapters on method are well enough executed to be exceedingly instructive to beginners in science, though the author does not always attain the American standard of clearness. For instance, in defining what it means in the doctrine of chances to say that a die turns up a particular face "about one-sixth of the time," Mr. Scripture not only talks about a "scale of certainty" (meaning a scale of uncertainty), which has nothing to do with the frequency with which the face turns up, but he also introduces the probability-function, thus substituting a theorem for the definition on which that theorem rests; and while he thus admits alien ideas into his definition, he altogether ignores several essential elements, and, in doing so, leaves the door open for serious fallacies.

Again, Dr. Scripture is excessively strict, not to say stern, in requiring that statistics and bodies of measurements shall conform to the characters of random collections. He demands, for example, that the number of extreme values shall not exceed that determined by the theory. This would, from a theoretical point of view, be perfectly just, provided the probable effects of given amounts of departure from randomness were calculated and allowed for. Practically, however, Dr. Scripture's rule would have the effect of stripping science in every branch of almost all observations except such as had prudently not been often repeated or not been made numerically exact. It would leave astronomy without a leg to stand upon. We are not surprised to find this hyper-rhadamantine theory associated with practices equally removed from good sense in the direction of laxity. Thus, as a model of the proper treatment of observations, a series of eight observations are given, their mean taken, and their "mean error" calculated (not with strict accuracy, by the way, and several of the formulae exhibit this fault), although of the eight observations one departs from the mean in one direction by four times the amount by which the other seven, in the opposite direction. Dr. Scripture suggests that the "median," or middling value, would be better than the mean, which is as much as to say that, rather than rank the discordant observation as of equal value with the others, it would be preferable to use but one of the eight as a measure and all the rest as mere qualitative indicators. In reply to this, a remark in the previous chapter is pertinent: "Yet [if we substitute counting for measurement], in a case where a possibility of measurement exists, we are really throwing away an accurate method for a poorer one." Here native Yankee gumption peeps out. Had Dr. Scripture studied the works of first-rate mathematicians

among his own countrymen, as well as those of fourth-rate writers in inferior German translations, he would have learned of a better way of treating series of observations into which abnormal observations are mixed than that of merely counting them. There are other instances of extremely lax practice in treating measurements; but the above example will suffice.

The portion of the book devoted to psychological experiments proper is divided into three parts entitled Time, Energy, Space. This adopts an idea of Ostwald, the chemist, that Energy ought to be substituted for Mass, as a fundamental quantity in dynamics. Nothing more feeble has been put forth by a man of ability since Sir Isaac Newton's commentaries on the book of Daniel. That where there are three connected variables, independent functions of them may be substituted for the variables themselves, is a matter of course; so that nobody will dispute that, if we choose to do so, we can, for example, instead of saying that momentum is the product of mass into velocity, say that it is the quotient of the kinetic energy divided by the velocity. In that case, one might say, the less the velocity, the greater the momentum; meaning that if a moving body burst so that a portion of it had the same energy as the whole had had, then the greater its velocity, the smaller would be its momentum. But because moving bodies do not usually burst and in that sense alter their masses, but do continually change their kinetic energies, it follows that Ostwald's system would be inconvenient in experience; and since the human mind is formed upon the ordinary course of experience, that system is equally unnatural for the human mind. It has, in fact, nothing at all to recommend it, unless it be its enveloping the whole subject in a fog of metaphysics.

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A fifth part of the book gives the history of the new psychology. We notice one interesting remark, that Fechner's law was in part anticipated in Daniel Bernoulli's theory of "moral expectation." We are glad to acknowledge that that idle theory did contain the germ of a great truth, which Dr. Scripture has so acutely pointed out. We will not say more of the historical part, because we wish to avoid appearing utterly to condemn a work of a good deal of merit.

## BOOKS OF THE WEEK.

Addis, W. E. *The Documents of the Hexateuch*. Vol. II. Putnam. \$4.  
Biological Lectures. Delivered at Wood's Hall. 1898-97. Boston: Ginn & Co. \$2.15.  
Block, L. J. *Capricious Putnams*. \$1.25.  
Brownson, H. F. *Orestes A. Brownson's Early Life, 1803-1844*. Detroit, Mich.: H. F. Brownson.  
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Chester, Norley. *Stories from Dante*. F. Warne & Co. \$1.25.  
Collections and Recollections. By One Who has Kept a Diary. Harpers. \$2.50.  
Darmstadter, James. *The Zend Avesta*. [Sacred Books of the East.] Christian Literature Co. 1050-51. London: Elliot Stock.  
Edgar, Hon. J. D. *Canada and its Capital, with Sketches of Political and Social Life at Ottawa*. Toronto: George N. Morang. \$2.50.  
Foster, R. F. *Common Sense in Whist*. Brooklyn: R. F. Foster.  
Frankel, A. H. *In Gold We Trust!* Philadelphia: William H. Pile's Cornelli Taciti Vita Agricola. Oxford: Clarendon Press; New York: Henry Frowde.  
Gannett, Henry. *North America*. Vol. II. The United States. [Compendium of Geography and Travel.] London: Edward Stanford.  
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Hope, Anthony. *Rupert of Hentzau*. Henry Holt & Co. \$1.50.  
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Lye, Christian. *The Hespworth Mystery*. F. Warne & Co. \$1.50.  
Macgibbon, Barnes. *Where the* . . . Id. G. W. Dillingham Co. 50c.  
Mackie, Pauline E. *Re Leticia Salem Malde, A Story of Witchcraft*. Boston: Lamson, Wolfe & Co. \$1.50.  
Masson-Forrestier. *Angolaises de Jugo*. Paris: Colin & Cie.  
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Proctor, Marr. *Stories of Starland*. London: G. W. Bacon & Co.; New York: Potter & Putnam.  
Prothero, R. E. *The Works of Lord Byron. Letters and Journals*. Vol. I. London: Murray; New York: Scribners. \$2.  
Rennie, D. W. *Remarks and Collections of Thomas Hearne*. Vol. IV. Oxford: Clarendon Press; New York: Henry Frowde.  
Rend, Carveth. *Logic, Deductive and Inductive*. London: Grant Richards.  
Reed, Miss Helen L. *Miss Theodora. A West End Story*. Boston: R. G. Badger & Co.  
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Taylor, Prof. A. R. *The Study of the Child*. Appletons.  
The Atlantic Monthly. Vol. LXXXI. Boston: Houghton, Mifflin & Co.  
The Game in Wall Street, and How to Play It Successfully. J. S. Ogilvie Publishing Co.  
"The Living Age." April-June, 1898. Boston: Living Age Co.  
Turner, H. G. and Sutherland, Alexander. *The Development of Australian Literature*. Longmans, Green & Co. \$1.75.  
Twyler, Prof. M. C. *Glimpses of England: Social, Political, Literary*. Putnam. \$1.25.  
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