scientific principles which are the recognized foundation of their professional work and the basis of professional success. The work is that which has brought Germany up from insignificance, industrially, and made her one of the world's most important producers, placing her people in the foremost rank in all applied sciences and in all arts based upon science. Their opportunities are greater than those of their German colleagues; they recognize the facts and are evidently seeking to make the most of them. The record is rich in instructive and suggestive matter.

The earlier pages of the volume are given to the lists of officers, council, committees and members. The last number already—the Society was organized at the World's Congress at Chicago in 1893—nearly 300, of whom New York and Massachusetts claim 29 each; Ohio, 20; Pennsylvania, 18; Indiana and Illinois, each 15; Michigan, 13; Minnesota, 12, and other States smaller numbers; 36 States being represented, one Territory, and also Canada, England, France, Germany, Switzerland and Australia, mainly single representatives, although Canada has six. Any one occupying, or who has occupied, a position as a teacher in any branch of work in the engineering school or college is eligible to membership. The conventions occur annually and usually in conjunction, as to time and place, with the American Association for the Advancement of Science. The finances of the Society seem to be in admirable shape.

The proceedings for the year 1900 include an address by the President on the work of the nineteenth century in this field, the report of the committee appointed to answer the question, regarding industrial education generally: 'What shall it be?' an abstract of which has already been given in these columns, and a total of about twenty papers and reports of committees of a most valuable and interesting character. Those on the form of the industrial educational system, on 'Personality in Teaching' and on 'Business Methods in Teaching Engineering,' gave rise to earnest and helpful discussions of very general interest; as did, also, the two papers, coupled together, on the 'Present Status and Tendencies of Engineering Education in the United States' and on 'The Promotion of Engineering Education.' The last two papers on the list, one on 'The Modern Mechanical Laboratory,' presented simultaneously, also, to the Paris Congress on Applied Mechanics, and the other on 'Operating Work as a Feature of Electrical Laboratory Training,' were received too late for discussion.

Of these papers, the report first alluded to above, already noticed in these columns, is here printed, with a discussion of great extent and exceeding interest and in some respects perhaps more valuable than the report which provoked it. The report of the committee is strongly endorsed, and the speakers, including some of the ablest in the field, present a great variety of new views and of crucial problems such as must long afford food for thought to all interested in this subject. And what intelligent citizen is not thus interested? Heads of engineering and technical schools, practitioners, famed and expert, teachers, distinguished and likely to become distinguished, and every department of technical instruction and practise give testimony. The paper on 'Secondnry Technical Education' and those on details of work may be taken to be extensions of this discussion; and most helpful they are likely to prove to all who are either directly or indirectly concerned in this most important to the industrial community of all modern departments of applied science.

R. H. Thurston.

Kant's Cosmogony. Edited and Translated by W. Hastie, D.D., Professor of Divinity in the University of Glasgow. New York, The Macmillan Co. 1900. Cr. 8vo. Pp. cix + 205. Price, $1.90.

This is an excellent bit of work, not only admirable in the scholarship and learning that go to its execution, but noteworthy in its timeliness as a contribution to English 'Kant philology.' So far as the editor is concerned, the book means that the days of heat and partisanship about the critical philosophy are past, that a man dare call attention to Kant's place in scientific evolution and yet keep a whole skin. No doubt there are those who will squirm uncomfortably when they read; Kant's 'Natural

History and Theory of the Heavens,' as he ultimately designated its exposition, will probably be regarded hereafter as the most wonderful and enduring product of his genius" (Introduction i); and will write Dr. Hastie down a philosophical Dogberry. "It is a charming incongruity to find, while Leonato rages and Benedick offers his challenge, that Dogberry is the one to unravel the tangle of threads." Our editor, untrammeled by the faction of recent schools, sees more clearly than those who, distraught by preconceived opinion, have dealt us our Kant *schillernd*. In view of their battles, it may be added that the 'Natural History' possesses this chance of future fame—it can be understood.

Some of Dr. Hastie's friends may be inclined to regret that he has elected to enlist his uncommon erudition, strong personality and vital enthusiasm in the work of making other authors known, rather than in the production of original books. This regret is mitigated, in the present case, by the fascinating 'Introduction,' which is a real addition to our literature on Kant. Indeed, Dr. Hastie has done much more than 'edit and translate,' as the modest legend runs on the title page, and the result is a highly composite production, the contents of which it were well, therefore, to set forth in detail. The book falls into three distinct portions. *First*, comes the 'Translator's Introduction,' extending to 101 pages, and divided into eight sections, as follows: (1) 'Relation of Kant's Science to his Philosophy'; (2) 'the Scientific Return to Kant'; (3) 'Kant's Scientific Environment and Antecedents'; (4) 'Kant's Discovery of the Retardation of the Rotation of the Earth'; (5) 'Kant's Natural History and Theory of the Heavens'; (6) 'Kant's Cosmogony in its Historical Relations'; (7) 'Kant's Cosmogony in Relation to Religion and Theology'; (8) 'Kant's Scientific Achievement Generally.' The appropriateness of the dedication of the book to Lord Kelvin becomes apparent on this recital. *Second*, the main body of the work, presenting (1) a translation of Kant's essay on the question (proposed by the Royal Academy of Sciences at Berlin), 'Whether the Earth has undergone an Alteration of its Axial Rotation' (1754); (2) a translation of Kant's 'Universal Natural History and Theory of the Heavens; or an Essay on the Constitution and Mechanical Origin of the Whole Universe, treated according to Newton's Principles' (1755). These translations fill 167 pages. *Third*, the Appendices, giving (1) a translation of Konrad Dieterich's 'Summary of Kant's Theory of the Heavens,' taken from his 'Kant und Newton' (1876); (2) a translation of the 'Hamburg Account of the Theory of Thomas Wright of Durham,' taken from the MS. in the library of the university of Edinburgh. This MS. is an excerpt copy transcribed from the 'Freye Urtheile und Nachrichten zum Aufnehmen der Wissenschaften,' a periodical published at Hamburg. The Wright account came in the first number of the eighth year (January, 1751). Wright's work, there summarized, was entitled, "An Original Theory or New Hypothesis of the Universe, Founded upon the Laws of Nature, and solving by Mathematical Principles the General Phenomena of the Visible Creation; and particularly the *Via Lactea*. Comprised in Nine Familiar Letters from the Author to his Friend. And illustrated with upwards of thirty graven and mezzo-tinted Plates by the best Masters. London, MDCCL." This portion is embellished with a protrait of Wright. (3) A reprint of 'De Morgan's Account of the Speculations of Thomas Wright of Durham.' This is taken from the 'London, Edinburgh and Dublin Philosophical Magazine and Journal of Science,' volume xxxii (1848). These appendices fill 38 pages.

By merely glancing over these titles, any one can infer that, if the labor involved be well done, the book constitutes a most valuable contribution to a chapter in the history of the relation between science and philosophy. As I have already said, Dr. Hastie's part is admirably sustained. Indeed, I would have scientific men, in particular, read the book carefully, for it must act as a powerful solvent upon certain unfortunate prejudices.

A word, in passing, about Wright. Like many another, so unfortunate as to live ere the times were ripe, he has been consigned to unmerited oblivion. Even the writer of the entry upon him in the 'Dictionary of National Biography'—a work so uniformly accurate—is un-

aware of the sources from which information could have been obtained, and so has nothing to tell,—does not even know the dates of his birth and death, or why he was called 'of Durham.' Wright was born at Byer's Green, near Durham, in 1711, and died there in 1786. Brought up as a 'philosophical instrument-maker,' his attention was called early to mathematico-physical problems and, by his thirty-first year, he had gained such reputation as a teacher of mathematics (like other eminent English scientists, a *private* teacher) that he was called to the chair of navigation by the Imperial Academy of St. Petersburg, an offer which he did not accept. There would seem to be no reasonable doubt that he was the first to light upon the modern physico-philosophical theory of the material universe. As De Morgan says, 'He gave the theory of the milky way which is now considered as established,' and he predicted 'the ultimate resolution of the rings of Saturn into congeries of small satellites' (203). The conclusion of Wright's seventh letter furnishes a striking instance of his remarkable prevision. "Thus, Sir, you have had my full opinion, without the least reserve, concerning the visible creation, considered as part of the finite universe; how far I have succeeded in my designed solution of the *Via Lactea*, upon which the theory of the whole is formed, is a thing will hardly be known in the present century, as in all probability it may require some ages of observation to discover the truth of it" (202). The 'ages of observation' and the Lick Observatory have not failed him. An edition of the 'Original Theory' was published in this country, at Philadelphia, by Rafinesque (1837). If Dr. Hastie had done no more than rescue this man's name from blank oblivion, he had deserved well of students of science. And he has accomplished much besides.

Apart altogether from its contribution to our knowledge of the manner in which Kant's early scientific studies influenced his later philosophical speculation—a contribution by no means inconsiderable as our somewhat scanty literature in English goes, the book ought to have distinct effect in bringing us to a clear consciousness of the close and friendly relations between science and philosophy maintained from the days of Bacon, Galileo and Descartes till broken off, during the estrangement between the German idealists and modern scientific men, since 1840. This is a long story, upon which I can not enter now. Further, it happens to have been misunderstood or forgotten till within the last few years. An earnest of better things appears to some at least to be one of the most interesting features of contemporary tendencies. To build this promise into actual fact, we need just such books as this. And, accordingly, Dr. Hastie has fairly won our warmest thanks. It is one of his greatest merits that he stands clear from all scientific and philosophical controversies, and so can state what he knows in its definite bearings, not in those which he might desire it to assume.

There must be some good hope for the future of Scottish theology when, at the university which has recently lost from its staff the most eminent living British physicist and the greatest living British Kantian scholar, the chief chair of the divinity faculty is ornamented by the occupancy of a thinker so successful in appreciative unification of the sundered learning of his famous colleagues.

R. M. Wenley.

University of Michigan.

A School Chemistry. Intended for use in High Schools and in Elementary Classes in Colleges. By John Waddell, B.A. (Dal. Coll.), B.Sc. (Lond.), Ph.D. (Heidelberg), D.Sc. (Edin.). Member of the American Chemical Society; formerly Assistant to the Professor of Chemistry in Edinburgh University; Lecturer in Chemistry in the School of Mining, Kingston.

So far as the general method of arrangement and treatment is concerned, this book is similar to others intended for the same purpose; but there are several points to which attention might be called. The author has avoided the error so often made of subordinating facts to theories, and says in the preface: "The endeavor is made in this book to help the pupil in the discovery of new facts, to enable him to see their connections, and to show how facts lead to theory and theory aids in investigation