of the International Geological Congress as erroneous. In the June number of the *American Geologist*, p. 386, will be found an accurate print of the official type-written notes of that meeting by the secretary, Professor H. S. Williams, signed by him, and sent to me with the request for my vote on the question of appealing to the bureau to change the place of meeting. This official statement establishes, first, that of those present, Powell, Dutton, Gilbert, Hague, Marsh, Walcott, and Williams were officers of the United States Geological Survey, and Cope, Hall, Lesley, Stevenson, Whitfield, Winchell, and Frazer were not. The above comprised all who were present. Of those who were not members of the United States Geological Survey, Lesley, Stevenson, Whitfield, and Winchell voted for the submission of the question to the bureau.

Capt. Dutton of the United States Geological Survey did not vote. If the vote was as stated, 9 to 3, who constituted the nine? Professor Lesley rightly says Hall, Cope, and Frazer voted "no."

So much for the vote being carried by the members of the United States Geological Survey.

Major Powell moved that "it is the opinion of the committee that the place should be changed" (see the secretary's official notes). I was also present at the meeting, and can testify to the accuracy of the secretary's notes. Major Powell did *not* oppose the selection of Washington, but remained silent while it was voted.

Only after the meeting was it given out that Major Powell did not wish the congress to come to Washington. He certainly did *not* urge "that nothing be done by the committee to cause such an action abroad" (i.e., the change).

Both Major Powell and the writer of the above note emulated Shakspeare's Julius Cæsar in putting off the crown, but, like that hero, ended by accepting it. PERSIFOR FRAZER.

Sea Girt, N.J., June 30.

BOOK-REVIEWS.

A Handbook of Descriptive and Practical Astronomy. II. Instruments and Practical Astronomy. By GEORGE F. CHAMBERS. 4th ed. New York, Macmillan, 1890. 8°. $5.25.

PROBABLY at no time have there been so many amateur astronomers with good telescopes as at present, and for all these would-be astronomers this book on astronomical instruments and their use will have an interest.

Chambers's "Astronomy" calls for no introduction to public attention at our hands, as the fact that this is a fourth edition testifies; but it may be well to repeat, what we announced when noticing the first volume of this new edition some weeks since, that the revision this time will result in the production of several distinct volumes, each treating of some special phases of astronomical science. It is thus that the present volume is limited to instruments, their employment in observations, and the proper mounting and housing of them.

Every one who knows the possessor of a good telescope knows how desirous this possibly happy personage is to have his instrument where it can be used. To meet this very want, our author has introduced a number of plans for small observatories, suggested not only by his own experience, but also by that of several of his professional friends. We feel sure that these will be eagerly sought by the amateur astronomers of this country, as well as by those of Great Britain, for whom they are specially intended.

But it must not be supposed that America has been neglected, for good descriptions are given of some of our newest and best observatories.

One chapter is devoted to a history of the telescope, which gives a completeness to the work, and is likely to furnish answers to the queries of many a questioning visitor.

The use of the spectroscope in astronomical work, which has led to so many important results, and which has so much fascination for those who have not the time to follow up the older astronomy, is cared for in several chapters.

We commend this book, and trust its use may help a few on this side of the water to a more intelligent use of their time and their opportunities, so far as they have available instruments, in developing some really important investigation in astronomical physics. The play of seeing more clearly than with the naked eye the features of the "man in the moon" soon ceases to give pleasure, and bears no proportion to the real delight of securing some small addition to the world's stock of knowledge, which can be had as the result of some intelligent work. Let those who wish for this delight secure a copy of the book here noticed, that they may know more of what is within their reach.

The True Grasses. By EDUARD HACKEL. Tr. by F. Lamson-Scribner and E. A. Southworth. New York, Holt. 8°. $1.50.

THIS is a good translation of Professor Hackel's valuable contribution to *Die natürlichen Pflanzenfamilien*, that great German publication on the natural families of plants edited by Dr. Engler and Dr. Prantl. As Professor Hackel stands among the foremost agrostologists, his work, expressing as it does the latest and most authoritative views upon the subject, is especially valuable; and, as it contains so much that is of practical importance, we are glad to see it made available to English readers.

The work embraces the grass family as a whole, and enumerates the best-known economic species and their uses. It discusses the structure and morphology of the grasses and their arrangement into tribes and genera, and points out their characters in a manner that will enable one to classify readily any grass that may come into his hand. For the benefit of persons unfamiliar with botanical keys, an illustration of the manner of using the keys of analysis is given in a brief introductory chapter; and a full glossary and index are appended, adding much to the usefulness and value of the work, especially for private students and general readers. The illustrations, of which there are upwards of a hundred, are mainly reproductions from the originals in the German work, though a few were drawn especially for this translation.

The Elements of Machine Design. 11th ed. By W. CAWTHORNE UNWIN. New York and London, Longmans, Green, & Co. 16°. $2.

THIS admirable and unique treatise on the elements of the work of the mechanical engineer designing machinery has now been in use in schools and offices on both sides the Atlantic for some years, and has been repeatedly revised and continually extended, until, from a little volume of perhaps three hundred pages, it has grown to two volumes of larger extent; and a third part is more than half promised by its distinguished author. It is attempted by its writer to give a fairly complete account of the methods of proportioning parts of machinery, and especially of that representative machine the steam engine, such as are in use in the best practice of the most successful builders, and such as are at the same time sanctioned by the best scientific authority. The work is in some respects, in English, a counterpart of that of Reuleaux in the German; but it is more directly adapted to the needs of the practitioner, and the custom and practice of the shops. It is a success, as is well indicated by the extent to which it has been adopted as a handbook and as a text-book, and by its rapid sale.

It gives a concise account of the materials used by the engineer; describes the various straining actions met with in machines; exhibits the results of research and experience as to straining action in structures and elements of machines; summarizes the results of latest experiments upon the strength of the several kinds of riveted joints, as used in boiler-work; determines the proportions of bolts, keys, and other connecting pieces, of journals and pins, and shafts and gearing. The principles of friction are applied in the determination of the proper proportions of bearings, and to the measurement of the efficiencies of machinery; while belting and rope transmission are given extended study. The second volume will deal with the details of parts of engines and machinery, and is promised for some time during the coming season. The third part will be devoted to the design of complete machines.

The book is brought up to date in a very satisfactory manner. The chapter on riveting is given large extent, and includes the results of the experiments of its author on riveting, as reported to the Institution of Mechanical Engineers. That on friction is the

only one in the modern technical literature of machine design, of this character, so far as we know, which includes the now well-known facts relating to the modification of the laws of solid friction by the introduction of the lubricant. The experiments of Hirn, who first discovered this modification, are alluded to, and those of Tower are given considerable attention; but, curiously enough, those of Thurston and of Woodbury in this country, which have been vastly more extensive, and which relate much more closely to the conditions of familiar ordinary practice, are not even mentioned, though they are now the basis of all rational work in the proportioning of journals, under other conditions than those of the Morin experiments, or of the comparatively rare "oil-bath" lubrication.

Elementary Dynamics of Particles and Solids. By W. M. HICKS. London and New York, Macmillan. 12°. $1.60.

THIS closely printed text-book, in the neat standard style of the Macmillans' publications of the class, is a well-written treatise on the elements of mechanics for schools and colleges. It is substantially of the same grade, and of similar extent, with those familiar to teachers as usually adopted in the English institutions of learning. In such a case there is little opportunity for originality, and the subject admits of but little safe or profitable variation from the almost universal and standard methods of treatment. As stated by its author, the chief points of novelty are the consideration of the division of statics as a special case of kinetics, and the methods of discussion of the ideas of mass and of momentum, which are considered before taking up the ideas of force and resistance. This the author thinks the best, if not the only logical, order of procedure; and especially so, as the whole must be subject to confirmation and proof experimentally. He would establish his work on this basis, rather than upon the usual system of assumption, from experience, of general laws, and a logical construction of the science by building upon those laws. The work is well done, and, for those who prefer this method of treatment, it will be found an excellent text-book. The order of treatment is, (1) rectilinear motion of a particle, (2) forces in one plane, (3) motion of rigid bodies. An unusually rich collection of problems and examples is given.

The second part includes the study of machines and the modification of their efficiency by friction; the book being intended, as the author says, to meet the wants of mechanical engineers, as well as the classes of schools and colleges. It will hardly meet the needs of that class, however, as it is far too elementary and incomplete, as a system of applied mechanics, for their purposes. The treatment of the machines is the ancient one of studying the "six" (?) elementary machines, considering the inclined plane and the screw as different in principle, and the lever and the wheel and axle as different elementary machines. They are well treated. In the chapter on friction we have an example of the curious persistence of ancient and obsolete notions among the writers of text-books, who seem rarely to keep themselves abreast of the progress of research. The old notions of Coulomb are here made the basis of the study of friction losses of energy; and the author of the book seems entirely unaware that they have been obsolete, as respects lubricated surfaces, since the days of Hirn's investigations a generation ago. The young engineers of to-day might give such writers useful hints. The table of co-efficients of friction (six constants) is from the now almost forgotten work of Morin. They are, of course, correct for the conditions under which they were obtained, but not for other and the various usual conditions of machine operation; and no clew is given to the limitations of their application. The distinctions between friction of solids, friction of fluids, and "mediate" friction, are not alluded to.

Gems and Precious Stones of North America. By GEORGE F. KUNZ. New York, The Scientific Publishing Company. 4°. $10.

THE author of this book is connected with the world-renowned firm of Tiffany & Co., and in his employment by this house as a gem expert has had a rare opportunity to become acquainted with the matters of which he treats in the book before us. Further, this expert knowledge has led to the employment of Mr. Kunz by the United States Geological Survey on special investigations, which have made him the more conversant with his subject.

It may be asked, Are any gems found in North America? This question evidently presented itself to our author, as he opens his somewhat large treatise with the statement that gems are found here in great variety, but that there has been little systematic exploration for them, as the indications are not such as to justify the employment of large capital in the search. In fact, a week's yield of the granite-quarries exceeds in value the yearly output of gems the country over; and a day's yield of the South African diamond-mines is of more value than the year's yield of all gems in North America.

It is not to be supposed, however, that there is no search going on in this country for gems, or that cases are unknown in which persons for a while believe themselves the possessors of stones of great value found in their corn-field or sheep-pasture. Reports of such finds are constantly coming in, and many of them reach the jewelry house of Tiffany & Co. The stories of these deceptive stones, as told by Mr. Kunz, are interesting, and show that a book of the kind he has now brought out, if available in the libraries of the country, might quickly explain to the possessor of a green stone the differences between colored quartz and emerald.

Nine chapters are devoted to the gems of North America, in which descriptions are given of the gems, and chemical analyses to show their composition. A chapter follows on pearls, in which due attention is paid to the method of their formation. There are then two chapters on the precious stones of Canada and of Mexico and Central America. The book closes with two chapters devoted to aboriginal lapidarial work in North America, and to the commercial value and uses of gems.

Aside from the gems found in this country, there is, as wealth accumulates here, a constant increase in the number of interesting gems held here by collectors, and of these Mr. Kunz has something to say.

The undoubted standing of Mr. Kunz as an authority on gems makes this work a real accession to the number of books to which one may turn for information; and, though the annual commercial output of gems is small in North America, we feel sure, especially as so many cognate subjects are treated within the book's covers, that there will be many—collectors and artisans—who will find it a help.

The execution of the book is to be praised in most respects,—the beauty of the colored plates, which are numerous and add much to its usefulness, is especially noticeable, and the general typographical appearance is excellent,—but there was evidently something wrong with the proof-reading, which left a long list of errors to be corrected in the unsatisfactory way of a list of errata.

AMONG THE PUBLISHERS.

THOSE who are interested in the uses, tests for purity, and preparation of chemical re-agents employed in chemical, microscopic, or petrographic analysis will find much valuable information in "Chemical Re-agents," by Charles O. Curtman, M.D., recently published by the John L. Boland Book and Stationery Company, St. Louis.

— Messrs. Longmans, Green, & Co. have issued a "Junior School Algebra." The author is William S. Beard, assistant master in Christ's Hospital. The book is intended for use in preparatory schools.

— "School Hygiene," by W. J. Abel, recently issued by Longmans, Green, & Co., contains simple directions respecting ventilation, eyesight, infectious diseases, and first aid in injuries. There is no attempt to explain the why and wherefore of the courses of procedure recommended. The manual is intended, as its title suggests, for use in schools, and it aims to describe what to do and how to do it, in case of diseases, accidents, etc.

— The leading articles in *Babyhood* for July are, "Fruit for Children," by J. W. Byers, M.D.; "Weaning," by D. Warman, M.D.; "The Kindergarten on the Farm" (continued series), by Adele Oberndorf; and "The Baby's Mind," by Elizabeth S. Brown,