on the determination of azimuth follows it. The book closes with a very full and clear setting-forth of the subjects of precession, nutation, aberration, and proper-motion, with the formulæ for their application, and a set of tables most useful to the field-astronomer in reducing observations.

The most valuable and characteristic feature of the book is the excellent series of examples taken from actual modern practice, which accompany almost every method of using each instrument, and are fully discussed by the method of least-squares where its application is advantageous. There is throughout an endeavor to impress the importance of developing the degree of accuracy inherent in the observations, and the best methods of avoiding or eliminating systematic errors. The whole work bespeaks the thorough master of his subject. The warning as to parts of the normal-equations solution not checked by the proof-formulæ, the giving of the complete values of the auxiliaries in the formulæ for the weight-coefficients out to four unknown quantities, and many other points which would be overlooked by the mere book-maker or pure theorist, show that Professor Doolittle has thoroughly beaten the whole ground, and knows where the difficulties lie.

The typography of the book is excellent, and Professor Doolittle's known thoroughness gives us assurance that much less than the usual number of mistakes will be found in the printed text.

MEXICAN ETHNOLOGY.

THE magnificent ethnologic museum of the Trocadéro at Paris is one of the sights of that great capital which no scientific visitor should overlook. It is particularly rich in its American department, and the conservator of the museum, Dr. Hamy, has taken a pride not only in collecting in this department, but in studying his specimens and in publishing the results of his studies. As editor of the excellent *Révue d'ethnographie* he has always at his command a medium to give them promptly to the world. He has collected a number of these studies under the title, 'Decades Americanæ.' They treat of such topics as 'An anthropolith from Guadelupe,' 'Fishing industry in ancient times in the Californian Archipelago,' 'The Tzompantli,' 'An Aztec arrangement for supporting skulls,' 'The American solar wheel,' 'A pipe from King's Mound, Ashland,' etc. All these articles are freely illustrated, and the specimens are described and discussed with clearness and from an astonishing width of special reading.

The 'Anthropology of Mexico' is a work of much more ambitious character. In this large and handsome quarto published by the French government, Dr. Hamy discusses the human remains that have been collected by French explorers in various portions of Mexico. He places them in relation with the oldest relics of the stone age from the same region, and reaches the conclusion that the implements, at any rate, point to a period and condition of human life exactly the same as existed in the United States and Europe during the epoch of unpolished stone. In the crania examined the principal characteristics were marked prognathism and brachycephalism. These traits the author thinks are especially pronounced in the skulls of the Otomis and Mazahuas. Besides the minute descriptions and abundant lithographic illustrations with which he enlightens his topic, he enters somewhat fully into the earliest legendary history of Mexican ethnography, attempting to define more closely the identity and relations of those mysterious people, the Quinamies, the Olmecs, and the Xicalancos. He wisely, however, treads with caution on this very uncertain ground.

Mission scientifique au Mexique et dans l'Amérique Centrale. Anthropologie du Mexique. Par. M. E.-T. HAMY. Paris, *Imprimerie nationale*, 1884. 4°.

Decades Americanæ. Mémoires d'archéologie et d'ethnographie Américaines. Par le Dr. E.-T. HAMY. Paris, 1884.

ASTRONOMICAL NOTES.

Longitude signals between St. Louis and Mexico. — Professor H. S. Pritchett, director of the observatory of the Washington university at St. Louis, kindly communicates the results of a longitude campaign between his observatory and the Observatorio nacional de Mexico, Sr. A. Anguiano, director. A preliminary discussion gives $35^m\ 57^s.25$ as the difference of longitude, or $6^h\ 36^m\ 46^s.41$ W. of Greenwich as the resulting longitude of the transit-circle piers of the Mexican observatory. This differs $5^s.0$ from the old value determined by moon-culminations. The circuit was 2583 miles long, with five repeaters, and the armature time was quite constant, averaging $0^s.38$. The outfit of the Mexican national observatory includes a 15-inch equatorial by Grubb, and an 8-inch meridian-circle, and a 6-inch transit, both by Troughton and Simms. The *personnel* consists of the director (Sr. Anguiano) and five assistants.

Comet observations at Greenwich.—The somewhat unusual appearance in the *Astronomische nachrichten* (2688) of comet-observations communicated by the astronomer-royal attracts our attention, and we trust this is only the beginning of a continuous series. One point, we think, is worth noting. As communicated, they give the meas-

ured Δa and $\Delta \delta$, and then the *combined* correction for differential refraction and parallax. As every computer of the final orbit of a comet wishes to use his own corrected distances in applying the parallax, and as the distances used above are not stated, he must in this case re-compute both the differential refraction and the parallax-factors. It would certainly be better to publish the Δa and $\Delta \delta$ corrected for refraction, and the '$\log p\Delta$,' according to universal custom.

New or variable stars. — Mr. W. H. S. Monck, in the *Observatory*, 1885, 335, makes the suggestion that the new or temporary stars that occasionally appear may be due to swiftly-flying meteor streams in space, meeting a nebula or gaseous mass, either bright or dark, and suddenly heating a part to incandescence, as in the case of shooting stars striking our atmosphere.

Discovery of an asteroid. — A telegram from Professor Pickering announces the discovery on October 27 of a new asteroid, by Perrotin of the Nice observatory. Its position on October 27, at $7^h\ 12^m$, Washington mean time, was: right ascension, $1^h\ 8^m\ 53^s$; declination, $+7°\ 8'$, with daily motions of -36^s in right ascension, and $-7'$ in declination. This is the eighth asteroid discovered this year, and the sixth discovered by Perrotin.

Mr. Chandler's Almucantar.—We recently noted (*Science*, vi. 239) Mr. Chandler's correction to the latitude of the Harvard college observatory from almucantar-observations. Since then he has unquestionably shown (*Astr. nachr.*, 2687) that this instrument is capable of detecting slight errors in the positions of even some of the '*hauptsterne*' of Auwers' system, and of furnishing valuable corrections to them from a comparatively limited number of observations. Mr. Chandler's promised memoir upon the construction, theory, and use of the almucantar will be awaited with unusual interest.

Death of General Baeyer.—Geodesy has lost its most illustrious representative in the death, at the advanced age of 91, of Dr. J. J. Baeyer, founder of the European *Gradmessung*, president of its central bureau and of the Royal Prussian geodetic institute. He died on the night of September 10–11.

NOTES AND NEWS.

ACCORDING to the report of Superintendent Wear, of the Yellowstone national park, the maintenance of a strict watch day and night has resulted in breaking up, in a measure, the wholesale slaughter of game; and the park is now full of game of all kinds, including about two hundred head of bison, large numbers of elk, and several herds of antelope. By the new roads, access to the objects of interest is facilitated. It is recommended that the force of assistants be increased from ten to fifteen, as the present force is not large enough to prevent the commission of acts of vandalism. The travel in the park this summer has been much greater than ever before.

— President Porter has sent to the corporation his resignation of the presidency of Yale college, the resignation to take effect at Commencement, next June. He will, however, retain his position as Clark professor of moral philosophy.

— King Leopold of Belgium, it is reported, has already found the Kongo Free State a more expensive enterprise than he can carry on unaided. His recent visit to Wiesbaden was made, it is said, for the purpose of inducing some one of the German princes to assume the sovereignty of the Kongo country in his stead.

— R. T. Stupart, the Hudson Bay observer, who abandoned his station at Stupart Bay the day before the steamer Alert reached there, arrived in Halifax on Saturday, Oct. 31, on the steamer Miranda from St. John's, Newfoundland. Their voyage of twelve days in an open boat to Fort Chimo was exceedingly perilous.

— Supplementing the regular course of instruction at Sibley college, Cornell, a series of lectures on mechanical engineering will be delivered from time to time by members of a body of non-resident lecturers who have been chosen from among the most distinguished men of the profession. These gentlemen choose their own subjects, and times of lecture, and their own method of presentation of the subject selected. The director of the college announces that the following named gentlemen are engaged to lecture during the year 1885–86: Dr. E. D. Leavitt, jun., Dr. R. W. Raymond, Dr. C. E. Emory, Mr. Charles T. Porter, Mr. J. M. Allen, Mr. J. C. Hoadley.

— A petition to congress for a deed to San Miguel mountain — an excellent situation for an observatory, near San Diego — has been circulated by the San Diego society of natural history.

— The San Diego society of natural history has taken steps for the protection of the nearly extinct Punis Torreyana of San Diego county.

— The 'Lungen gymnastik' of Th. Huperz is really a handbook on the care and development of the lungs, and the attendant and reflex advantages of such care. Though he says it is for the physician, yet its style and method are such that it may be most successfully used by the laity. The