needed first to be determined upon, after careful experimental work. This whole matter was therefore, in 1885, committed to the hands of Professor Mendenhall.

Perhaps the most important item in internal administration, so far as it affects the permanent scientific value of the office-work, was the effort, heartily furthered by General Hazen, to improve the accuracy and international comparability of our instrumental equipment. The standards of the International bureau of weights and measures were recognized by him as being the proper legal standards for this office, and every effort was made to determine the corrections needed to reduce the past as well as the current meteorological observations of the signal service to agree therewith.

Perhaps the generous breadth of General Hazen's views, the absence of injurious jealousies, and his confidence in the principle that the weather-bureau would be strengthened by the widest diffusion of an intelligent appreciation of meteorology, are in nothing more clearly shown than in the earnestness with which he stimulated the formation of state weather-services, and encouraged the study of meteorology in every school and college. He was painfully impressed by the disastrous influence upon individuals and business of the wide-spread and utterly absurd predictions of the storms and weather of the 9th of March, 1884, which emanated from Mr. Vennor, and were distributed broadcast through the country. He saw clearly that all this harm could be prevented only by increasing the intelligence of the people in scientific matters, and heartily indorsed every effort to diffuse a more correct idea as to what constituted legitimate meteorology.

Although his duties demanded the maintenance of a great central office at Washington, yet General Hazen realized that centralization could easily be carried too far in scientific matters, and would thus react injuriously upon the work of his office. He was desirous of rapid progress in all directions, and, to secure this, welcomed every prospect of co-operation with other institutions as well as with individuals. One of his first acts was the request for co-operation on the part of the National academy of sciences. He improved the opportunity to help Professor Langley in the determination of the absorbing-power of the atmosphere; he accepted Professor King's offer to carry observers on his balloon voyages; he heartily furthered Lieutenant Greely's efforts to maintain an international polar station, and joined with the coast survey in establishing a similar station, under Lieutenant Ray, at the northern point of Alaska; he co-operated with the bureau of navigation in securing weather-reports from the ocean; he powerfully assisted the metrological society in its labors for the reformation of our complicated system of local times, the result of which was the adoption by the country of the present simple system of standard meridians one hour apart.

Equally successful was he in his efforts to co-operate in various methods of disseminating and utilizing the knowledge obtained by the weather-bureau for the benefit of the business interests of the country. With the telegraph companies he published the daily telegraph bulletin. Through the railroad companies he displayed the railroad train signals, visible to every farmer along the railroads. With local boards of trade and other business interests he elaborated our system of flood-warnings in the river-valleys.

General Hazen was especially clear in his views as to the importance of giving personal credit to each man for his own personal work. Routine work was credited to the assistants in charge, and not to the impersonal office. Having assigned a special work to the best man available, he took pains to give him the credit, and make him personally responsible for its success, thus securing more enthusiasm in the work.

This notice of a few prominent features in the intense activity of General Hazen's life seems eulogistic rather than historical; but, to the contrary, the fact is, that military life rarely offers a position that requires the promotion of any special science, and still more rarely do official or military circles present an officer who so thoroughly desired, as far as allowable, to relax stringent military law, and liberally interpret cumbersome official regulations, so that scientific men might successfully promote their special work.

CLEVELAND ABBE.

ETHNOLOGICAL NOTES.

THE Proceedings of the U. S. national museum, for 1886, contain a paper by George H. Boehmer on Norsk naval architecture. He compares the modern Northland boat, which is in use along the coast of Norway, round the North Cape to the frontier of Russia, with the ancient Norsk boat. In this boat he recognizes the oldest forms known. These are known from the rock sculptures discovered in Sweden and Norway, which are supposed to have been made from five to eight hundred years before the Christian era; from boat-shaped stone burial-groups, supposed to have been erected during the transition time from the bronze period to the iron age, in Scandinavia; and from boat-remains. The boat is long, narrow, and low, with stem and stern posts alike, both being curved and high. The rowlocks of these boats bear an oblique pro-

longation on one end, and are furnished with a loop through which the oar is passed. They have a single mast amidships, and a single sail. In the rock carvings similar boats are represented all along the coasts of the Baltic, as far east as the south-east bank of Onega Lake, and on the coast of Norway. In the boat-shaped stone groups the high stem and stern posts are indicated by large bowlders; the rowlocks, by excavations in the stones. The boat-relics resemble the modern boat even in details, and show how little change has been made in northern naval architecture since olden times.

Donald A. Cameron, English consul for eastern Soudan, is studying the ethnology of the district of Suakin. The preliminary result of his researches is that the Beja (Bisharin), which is the general name applied to all tribes of that country speaking Tobedawiet, are the aborigines, who gradually adopted Islam through contact with the coast or with Egypt after they had absorbed a number of Arabs from Yemen who had invaded their country (*Journ. anthrop. inst.*, Feb. 1887).

The Bulletin of the Italian geographical society, for February, contains the catalogue of an ethnological collection made by General Gené in the Italian possessions on the Red Sea. It consists of implements, clothing, ornaments, and weapons belonging to the Beja, and some Somali and Abyssinian objects. The explanation of the well-known implements is very full, and contains much valuable information.

Ph. Paulitschke has published the results of his studies on the Somali, Galla, and Harrari ('Beiträge zur Ethnographie und Anthropologie der Somâl, Galla, und Hararî,' Leipzig, 1886). He gives a full description of the ethnological character of these peoples, and several anthropological measurements. It is impossible to point out the numerous new observations contained in this book, and we confine ourselves to stating the conclusions at which the author arrives regarding the history of these peoples. Originally the country was inhabited by negroes who had been driven from their old seats by Hamitic invaders, who came from the north. Later on, an Arabic invasion took place, which began in the sixth century and lasted until the sixteenth. The invaders and Hamites intermarried, and thus formed the Somali and Dankali, which latter contain a larger proportion of Semites. These nations attacked the Gallas, who were driven from the shore to the country they now occupy. A map which accompanies the book shows the distribution of the tribes.

R. N. Cust has presented to the Anthropological institute of England a collection of symbolic letters such as are used by the Jebu in West Africa. They are figured in the Journal of the anthropological institute (February, 1887), and full explanations are given. There are many specimens of such messages in the ethnological collections; but few of them have the explanations, which alone make them valuable. It would be very desirable to have examples of symbolic messages collected among all peoples, and their study pursued in connection with that of picture-writing and sign-language.

The Journal of the anthropological institute (February, 1887) contains an interesting paper by A. W. Howitt, on songs and song-makers of some Australian tribes, and several specimens of songs noted down by G. W. Torrance. The poets of the tribes are held in great esteem. Their names are known to the neighboring peoples, and their songs are carried from tribe to tribe, even beyond the limits of the language in which they are composed. The natives believe that the songs are obtained by the bards from the spirits of the deceased, usually their relatives, during sleep, in dreams; but Howitt gives some instances of songs which are descriptive of events, and, as the poets declare, composed under the influence of some natural cause. Torrance gives three tunes, which he has divided into bars, according to the style of our music. This, however, is not correct, as the irregular accent does not allow their being arranged in this way. Fortunately the study of aboriginal poetry and music is being taken up now by several students. We call to mind Brinton's, Stumpf's, and Baker's researches. But an energetic pursuit is very desirable, as the native literature, which is handed down by tradition alone, is being rapidly lost everywhere.

Dr. H. Rink announces the death of Samuel Kleinschmidt, which occurred at Godhaab, Greenland, Feb. 9, 1886. Kleinschmidt, who was born in Greenland, is distinguished by his eminent knowledge of the Eskimo language. The results of his studies, which form the foundation of our knowledge of that language, are contained in his dictionary and grammar of the Eskimo language. Of late he took an active part in studying the meteorology of Greenland.

W. Sievers gives a brief sketch of the Arhuaco Indians, who live in the Sierra Nevada de Santa Marta, in the *Zeitschrift der Gesellschaft für Erdkunde* (vol. xxi. p. 387). The author travelled in Columbia in 1886, and visited the four villages of these Indians. The natives living on the northern declivity of the Sierra have preserved their old customs to a higher degree than the rest. Sievers describes their round, low huts and their scanty household goods, which consist of a pot, a bed, a few wooden stools, and a number of pouches

made of the fibres of the agave. The men and the women live in separate houses, and are never allowed to be in one room. The man takes his meals on a stone, between his house and that of his wife. They eat little meat, but live principally on vegetables, which are grown in small gardens. Though many of them have become Christians, they still adhere to their old religious feasts and dances, which they perform at the celebration of the saints of their villages. Each tribe has its peculiar dances, which are accompanied by two kinds of flutes, marimbas, and rattles. Sievers states that they believe a woman, by the name of Inhimpitu, to have been the mother of the ancestors of their gentes. These ancestors created the earth, the houses, the sun, — which formerly was buried in the ground, — the moon, and the stars. Takina is their principal place of worship. Here rows of stones are found, with interplaced granite bowlders. A wizard watches this place, which no Spaniard is allowed to visit. In a small temple, and two huts which stand near by, various utensils used in the worship are kept, — drums, flutes, masks, rattles, and tripods made of wood. Under one of the large bowlders is the grave of a wizard, to whom they give offerings. The wizards cause disease by throwing spiders, scorpions, or lizards into the bodies of their enemies, and cure the sick by extricating the cause of the disease. They are not allowed to eat any salt. During the great festivals, which are celebrated in January, the Indians must abstain from the meat of domesticated animals. At Masinga, on the upper Manzanares, there are large ruins of a temple, and long, remarkably straight roads leading to it. Ancient roads are found in many parts of the Sierra, and are frequently used for the construction of modern roads. A grammar of the language of the Arhuaco, the Köggaba, has been published by R. Caledòn ('Gramatica de la lengua Köggaba,' Paris, 1886).

E. T. Hamy believes that the sinuous line which is found on one of the monuments of Copan, in Honduras, is identical with the Chinese Taï-Ki (*Journ. anthrop. inst.*, February, 1887). Though these figures closely resemble one another, both consisting of two semicircles lying in opposite directions and touching each other, this is no proof of a common origin and identical meaning. The Chinese symbol represents two opposite principles, — the active and passive spirits, the masculine and feminine, light and darkness. The conclusion drawn from the similarity of ornaments occurring in widely separated regions, upon the identity of their symbolic meaning or their common origin, is fallacious.

Chaffanjon, who is exploring the upper Orinoco, found at Ature, in a cave of the Cerro de los muertos, the burial-place of the Piaroas. The corpses and those objects which had been most valuable to the deceased are put into a kind of basket, or into a cylinder made of twigs arranged in parallel lines round the body and tied together. Most of them are covered with stones to keep them from being disturbed. In the cave of Arvina, in Cerro Saloajito, Chaffanjon found vases differing in style from those which Dr. Creyaux found at Maipure. On the rocks of Cerro Purtado he found large sculptures. From his observations on these inscriptions he concludes that extraordinary means and a long time were required for making them. These petroglyphs seem to be of frequent occurrence in those districts. Recently A. Jahn found several in the Loma de Maya, west of Caracas. One of them is figured in the *Zeitschrift für Ethnologie* (1886, p. 371). The commission for determining the boundary between Brazil and Venezuela found others on the left bank of the Guainia, between Solano and Buena Vista. Similar rock inscriptions are found below Maroa, near San Gabriel, Itapinima, and at other places, and, according to W. Sievers, on the upper Manzanares. Chaffanjon studied the dialects of the country he traversed, and collected extensive vocabularies of the Baniba, Piaroa, Guahiro, Puinabe, Piapoco, and some of their grammatical elements. All of these belong to the same stock.

GEOGRAPHICAL NOTES.

Europe.

The government of Roumenia plans a triangulation of that country. As the basis of the present maps is founded on the reconnaissance made by the Austrian army during the occupation of Roumenia in 1855, a thorough survey is very desirable for completing our knowledge of the topography of Europe.

Asia.

The following notes on the work of the Indian survey are taken from *Petermann's Mittheilungen*. Besides the regular reports, the annual report for 1884 and 1885 contains the results of expeditions made in the countries adjoining India. Col. R. G. Woodthorpe visited the western head waters of the Irawadi, — the Nam Kiu. He followed the Dihing, a tributary of the Brahmaputra, to its sources, crossed the Phungan Mountains at the Chaukan Pass, and reached, south of the farthest point reached by Wilcox in 1826, the Nam Lung, which he descended to its confluence with the