bel are in cavo-relievo, similar to many of the Assyrian sculptures. Most of these carvings represent sacrifice and adoration. Dr. Habel considers that they represent a period of culture when the people were passing from the worship of the sun and other heavenly bodies to that of man, or the beginning of anthropomorphism. One of these monoliths, which is a stone twelve feet high, three feet wide, and two feet thick, is reproduced in the accompanying figure. It is supposed to represent a priest offering the sacrifice of a human being. He holds the head in his left hand, and in his right is the knife with which he has severed the head from the body upon which he stands. At the lower part of the stone two attendant figures are represented, each carrying a human head. One of these smaller figures has a skull for a head, and is supposed to symbolize death. This figure also occurs on other of these carved stones. The elaborate ornamentation of the naked body of the priest is characteristic of all the figures given by Habel. In this instance the headdress is in the form of a crab, and the hair is arranged in a sort of queue, with many decorations appended. The ear has a small ring in the lobe, from which hangs a larger ring. Around the neck is a cord and tassel, and about the waist is an elaborate girdle having at the back the head of an animal. Just below the right knee there is a garter. This occurs on all similar figures. The left foot is protected by a sandal. In some of the other figures both feet have sandals, and in one both are naked. The curved figures above the right hand of the priest, and below the body of the victim, are supposed to represent speech, as they occur with various modifications in several other carvings. In connection with these singular Central-American works of art, it is of interest to recall the carved shells found in mounds in the United States, and recently figured by Mr. Holmes in the report of the Bureau of ethnology, as the expression of ideas in a similar manner suggests a common origin.

THE PROPOSED CHANGE IN THE ASTRONOMICAL DAY.

Two eminent astronomers have recently given their views on the proposed change of the astronomical day, and both are inclined to favor the change. This discussion, which is of particular interest to astronomers, is on the sixth resolution of the Prime-meridian conference of Washington, — "that the conference expresses the hope, that, as soon as may be practicable, the astronomical and nautical days will be arranged everywhere to begin at mean midnight." The present custom, as we know, is for the astronomer to begin his day at noon of the civil day; and we are glad to find given at some length the opinions of such authorities as Struve and Oppolzer.

Professor Struve, director of the Pulkowa observatory, in a pamphlet[1] of twenty-seven pages, gives a very interesting account of the causes which led to the international conference, and the results which it reached. In regard to the change in the beginning of the astronomical day, he thinks that the question before astronomers is not only of giving up a long-established custom, with consequent changes of rules of many years' standing, but it also involves a serious interruption of astronomical chronology. Without a doubt, the astronomer would have to make a decided sacrifice in conforming to the wish of the conference; but, after all, this sacrifice is no greater than our forefathers made when they changed from the Julian to the Gregorian calendar, — a sacrifice to convenience of which we are still made sensible whenever we have occasion to go back to early observations.

We need have little hesitation in making a similar sacrifice, if it will prevent discordance between the civil and scientific custom of reckoning time, particularly troublesome where astronomical establishments come in contact with the outer world.

Professor Struve states that the Pulkowa observatory is prepared to adopt the new time, the only question being as to the epoch when the change should be introduced in the publications of the observatory. He is inclined to recommend that this should be deferred until some agreement can be reached by astronomers, and until the new time is adopted in the Ephemerides. This might be for the year 1890, or perhaps, better still, at the beginning of the next century.

Professor Oppolzer has contributed a paper on the proposed change of the astronomical day to the March number of the *Monthly notices of the Royal astronomical society* (vol. xlv. pp. 296–298). He says, "When once such a universal time is introduced for all purposes, it is quite natural that the question must arise, if there is indeed so great a necessity to retain in astronomy, and only in astronomy, a different reckoning of time. I fail to see this necessity, and I do not think that it would cause any serious trouble or confusion if a change were to be made in our astronomical reckoning; whilst a special mode of reckoning time in one science only, when all others use the generally adopted standard, will, without doubt, be a source of error and confusion." He then takes up in some detail the objections urged against the proposed change by Professor Newcomb in a previous communication to the same publication (vol. xlv. pp. 122, 123), and he discusses the changes which would be necessary in the Ephemerides. Professor Oppolzer proposes to give practical effect to his views by adopting the new reckoning of time in an extensive list of eight thousand solar, and fifty-two hundred lunar, eclipses which he is now preparing for publication.

It is difficult to see how this matter will finally be decided. It is evidently a question for astronomers to settle among themselves; but so far they seem to be very evenly divided. For instance: out of some twenty-seven astronomers whose opinions, more or less decided, have been accessible for a count, thirteen seem inclined to favor the proposed change, while fourteen are opposed to it. And among

[1] Die beschlüsse der Washingtoner meridianconferenz. St. Petersburg, 1885. 27 p. 8°.

the *pros* are Adams, Struve, and Christie; among the *cons*, Newcomb, Foerster, and Auwers.

W. C. W.

THE NATIVES OF AMERICA.[1]

THE native population (before the changes wrought by the European conquest) of the great continent of America, excluding the Eskimo, present, considering the vast extent of the country they inhabit, and the great differences of climate and other surrounding conditions, a remarkable similarity of essential characters, with much diversity of detail.

The construction of the numerous American languages, of which as many as twelve hundred have been distinguished, is said to point to unity of origin; as, though widely different in many respects, they are all, or nearly all, constructed on the same general grammatical principle, — that called polysynthesis, which differs from that of the languages of any of the old-world nations. The mental characteristics of all the American tribes have much that is in common; and the very different stages of culture to which they had attained at the time of the conquest, as that of the Incas and Aztecs, and the hunting and fishing tribes of the north and south, which have been quoted as evidence of diversities of race, were not greater than those between different nations of Europe — as Gauls and Germans on one hand, and Greeks and Romans on the other — in the time of Julius Caesar. Yet all these were Aryans; and, in treating the Americans as one race, it is not intended that they are more closely allied than the different Aryan people of Europe and Asia. The best argument that can be used for the unity of the American race, using the word in a broad sense, is the great difficulty of forming any natural divisions founded upon physical characters. The important character of the hair does not differ throughout the whole continent. It is always straight and lank, long, and abundant on the scalp, but sparse elsewhere. The color of the skin is practically uniform, notwithstanding the enormous differences of climate under which many members of the group exist. In the features and cranium certain special modifications prevail in different districts, but the same forms appear at widely separated parts of the continent. I have examined skulls from Vancouver's Island, from Peru, and from Patagonia, which were almost undistinguishable from one another.

Naturalists who have admitted but three primary types of the human species have always found a difficulty with the Americans, hesitating between placing them with the Mongolian or so-called 'yellow' races, or elevating them to the rank of a primary group. Cuvier does not seem to have been able to settle this point to his own satisfaction, and leaves it an open question. Although the large majority of Americans have in the special form of the nasal bones, leading to the characteristic high bridge of the nose of the living face, in the well-developed superciliary ridge and retreating forehead, characters which distinguish them from the typical Asiatic Mongol, in many other respects they resemble them so much, that, although admitting the difficulties of the case, I am inclined to include them as aberrant members of the Mongolian type. It is, however, quite open to any one adopting the negro, Mongolian, and Caucasian as primary divisions, to place the American apart as a fourth.

Now that the high antiquity of man in America, perhaps as high as that which he has in Europe, has been discovered, the puzzling problem, from which part of the old world the people of America have sprung, has lost its significance. It is quite as likely that the people of Asia may have been derived from America, as the reverse. However this may be, the population of America had been, before the time of Columbus, practically isolated from the rest of the world, except at the extreme north. Such visits as those of the early Norsemen to the coasts of Greenland, Labrador, and Nova Scotia, or the possible accidental stranding of a canoe containing survivors of a voyage across the Pacific or the Atlantic, can have no appreciable effect upon the characteristics of the people. It is difficult, therefore, to look upon the anomalous and special characters of the American people as the effects of crossing, as was suggested in the case of the Australians, — a consideration which gives more weight to the view of treating them as a distinct primary division.

[1] Extract from the address of Prof. W. H. FLOWER as president of the Anthropological Institute of Great Britain.

CLAUS'S TEXT-BOOK OF ZOÖLOGY.

IT is an interesting and sad fact that England and America have not as yet produced one really good manual of zoölogy, while Germany has at least two of the first order. One of these, Professor Claus's 'Grundzüge der zoologie,' has reached its fourth edition, with every probability that a fifth will soon follow. The last edition contains about fourteen hundred pages. Its large size makes it unwieldy for the beginner, and, moreover, there are no figures. By shortening especially the descriptions of orders and families, and some further condensation, the book was reduced to about eight hundred pages, and space saved for about the same number of figures. The new book thus formed is the 'Lehrbuch der zoologie,' translated under the above title. In all Professor Claus's writings, one cannot fail to notice his judicial fairness. The discussion of Darwinism (vol. i. pp. 139–179) is especially remarkable for its impartiality and candor, as well as its clearness and condensation. The arrangement of material in the general part, and the descriptions of the types, show the comprehensiveness of his mind and the extensiveness of his knowledge, while his exact-

Elementary text-book of zoölogy. By Dr. C. CLAUS and ADAM SEDGWICK, with the assistance of F. G. HEATHCOTE. 2 vols. New York, *Macmillan*, 1885. 8°.