ner* has pointed out that there is a long period weather variation. His discussion of all the available data of pressure, rainfall, temperature, etc., led him to conclude that there is a periodical variation in the climates over the whole earth, the mean length of this period being about 35 years.

Since this work, a recent discussion of the sun-spot data by Dr. W. J. S. Lockyer† has brought to light a similar long period, and this has taught us that each eleven-year cycle is different from the one immediately preceding and that following it.

A further inquiry into the distribution of the solar prominences, as observed by Respighi, Secchi Tacchini, Ricco, and Mascari,‡ has resulted in increasing our knowledge of the circulation of the solar atmosphere. The centers of prominence action, or the centers of the prominence belts, have a tendency to move from low to high latitudes, the opposite of spots; generally speaking, two belts in each hemisphere exist for some time, then they couple up and move towards the solar poles, while in the meantime a new belt begins to form in low latitudes.§

The existence of prominences in the polar regions is coincident with great magnetic disturbances on the earth, just previous to or about the time of sun-spot maxima.‖ Further, these polar prominences are responsible for the existence of large coronal streamers near the solar poles, as seen during solar eclipses about the time of sun-spot maximum. In fact, recent research seems to indicate that this prominence circulation is intimately associated with all the different forms of the corona.*

There seems little doubt, therefore, that we must look to the study of the solar prominences not only as the primary factors in the magnetic and atmospheric changes in our sun, but as the instigators of the terrestrial variations.

In dealing with solar phenomena, especially from a meteorological point of view, it is of great importance that the solar disc be treated in zones and not as a whole.

Just as it has been shown that the prominences sometimes exist in these zones in one hemisphere at one time, so is this the case with spots, but unfortunately, it is only until very recently that the phenomena occurring in each hemisphere have been treated in this manner.

It has already been pointed out that a possible connection existed between changes in the spotted area of the sun and terrestrial temperatures. Quite recently this question has been studied by Charles Nordmann † who finds that—

> The mean terrestrial temperature exhibits a period sensibly equal to that of solar spots; the effect of spots is to diminish the mean terrestrial temperature, that is to say, that the curve which represents the variations of this is parallel to the inverse curve of the frequency of solar spots.

NORMAN LOCKYER.

SOLAR PHYSICS OBSERVATORY,
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THE GERMAN ANTHROPOLOGICAL ASSOCIATION.

THE German Anthropological Association is just as old as the German Empire. The thirty-fourth meeting of the society, held at Worms, August 9–13, 1903, was the first to take place since the death of its most distinguished founder, the late Ru-

* 'Klimaschwankungen,' Eduard Brückner (Vienna, 1890).

† *Proc. Roy. Soc.*, Vol. 68, pp. 285–300.

‡ 'Memorie della Societa degli Spettroscopisti Italiani.'

§ *Proc. Roy. Soc.*, Vol. 71, pp. 446–452.

‖ *Ibid.*, pp. 244–250.

* *Monthly Notices R. A. S.*, Vol. LXIII., 1903.

† *Comptes Rendus*, No. 18, May 4, 1903, Vol. 136.

dolph Virchow. Professor Virchow is said not to have missed a meeting of the association since its organization until disabled by the accident which eventually ended in his death. The tribute paid to him in Professor W. Waldeyer's presidential address was, therefore, eminently fitting. Virchow helped to do for anthropology in Germany thirty-three years ago what was done for anthropology in America only last year by the founders of the American Anthropological Association. He was a potent factor in the growth of the science, as well as of the new organization, and that of both was phenomenal. Three hundred and forty-five took part in the Worms meeting. A study of the program and of the audiences at every sitting was, to me, a source of inspiration, and strengthened my faith in the future of our own association, now scarcely more than a year old. But Professor Waldeyer's address was not all tribute. He called attention to the needs of an international understanding as to methods in anthropometry, of more thorough and general university instruction in anthropology; a closer union of the various anthropological organizations of each nation, and, for Germany especially, a great central anthropological institute for purposes of both research and instruction. Berlin was suggested as a suitable location for such an institute, on account of its large and varied collections. It was also suggested that municipal and provincial museums turn over to the central institute all needed duplicates and whatever else could be spared. This is precisely what is being done in Denmark, which has gone even further and made the director of her National Museum supervisor of all the provincial museums. The director pays an annual visit to each museum. If he finds specimens that are needed toward making the national collection more complete, the smaller museum must, for a consideration, part with these, even though they be not in the nature of duplicates.

Professor Schwalbe's paper, the first on the program, was somatological: 'On a Comprehensive Investigation of the Somatic Characters of the German People.' The speaker passed in review what had been done already in this direction. All are familiar with the collection of statistics relative to the color of the skin, hair and eyes of 6,758,827 German school children. These results, due largely to Ecker and Virchow, were published in 1886. Schaaffhausen's extensive catalogue of the collections of crania in the German museums aided materially in determining the distribution of head-form in the empire. Schwalbe hopes to see done for Germany what has been done for France by Collignon and Lapouge; for Italy, by Livi; and for Sweden, by Fürst and Retzius. More has been accomplished for Spain than for Germany; and even less is known about Great Britain, Denmark, Holland and Belgium. As regards the German Empire, exception must be made of Baden and Bavaria, thanks to the labors of Ammon and Ranke, respectively.

Observations on school children alone will not suffice, and in Prussia, especially, permission to make the necessary observations on soldiers has not yet been obtained from the Ministry of War. For fifteen years Professor Schwalbe has made use of material furnished by the anatomical and pathological institutes in Strassburg. In that time he has measured 4,000 Alsatians, 1,500 of which, including both sexes, were adults. Professor Schwalbe's paper was accompanied by a table designed for use in taking measurements on corpses. The interest in his paper found immediate expression in the appointment of a commission.

Professor Rudolph Martin presented 'Some New Anthropometric Instruments,'

intended both for the laboratory and for field-work. Professor Ranke discussed 'Brain Measurements and the Horizontal Plane of the Brain'; and Dr. Birkner, 'Race Anatomy of the Soft Parts of the Face.' The latter had prepared instructive tables showing the differences between the facial type of the Chinese and that of the European. The 'Comparative Osteology of the Human Forearm,' by Dr. Fischer, was a comparison of the upper portion of the ulna in man and anthropoids, with special reference to the Neanderthal race. Drawings and tables were used in illustration. Dr. Gaup's 'The Vertebrate Skull with Demonstrations from Models,' a phylogenetic study, was especially appreciated by the anatomists present.

Dr. Tschepourkowsky, secretary of the Russian Anthropological Society, was present and read a paper: 'On the Inheritance of the Cephalic Index from the Side of the Mother.' Professor Stieda presented: 'Painted Human Bones from Southern Russia.' The coloring matter was probably applied originally to the bodies at the time of burial, and received indirectly by the bones after the flesh had disappeared. Dr. K. von den Steinen spoke of "Genealogical 'Knotenschnüre' in the South Seas." This ancient and unique mnemotechnic system is still retained by the natives, and serves them as writing and as genealogical charts.

Dr. Thilenius's paper dealt with the art of a people now practically exterminated: 'Ornamental Carvings from Agomes' (Bismarck Archipelago). An interesting collection of wood carvings, especially spatulæ employed in the betel habit, has fortunately been preserved. The series includes all gradations between the human form and various animal forms.

Of kindred interest was 'The Significance of Mat- and Tattoo-patterns among the Marshall Islanders,' by A. Krämer. These unique and beautiful patterns are successfully combined with color schemes. Tattooing is looked upon as a gift of the gods and its execution is combined with religious ceremonies. Other ethnographic themes were: 'The Value of Ethnographic Analogies,' by Dr. Ehrenreich; 'South American Weaving and Basketry,' by Dr. Max Schmidt; 'The Problems of Social Ethnology,' by Dr. Steinmetz, and 'Ethnographic Transformations in Turkestan,' by R. Karutz, who referred to the changes that have taken place with the Russification of West Turkestan.

Professor Seger was heard on a subject in which he is *facile princeps:* 'The Ruins of Yukatan.' In his paper on 'The Protection of Prehistoric Monuments,' Dr. Seger recommends: (1) The passage of a protective law; (2) the appointment of a commission for each province; (3) the creation of a special fund to be used for the purpose of purchasing monuments or sites, of carrying on research and of publishing reports; (4) the fixing of geographic boundaries within which central, provincial and local museums are to find their respective spheres of influence and activity; (5) the adoption of a uniform procedure in respect to excavations, and the general treatment of specimens. The association inaugurated the movement in line with Dr. Seger's suggestions by appointing an archeological commission.

Dr. Edmund Blind's paper, entitled 'Neolithic Inhabitants of Alsace,' fills a gap in the anthropological history of that region. According to his researches, the Neolithic race in Alsace was dolichocephalic. Not a single brachycephalic skull was found, although some were on the borderland of mesocephaly. A similar topic, 'The Races of the Stone Age,' by L. Wilser, led to a lively discussion.

Dr. Lissauer's "Scheme of Classification

for 'Radnadeln' " had already appeared in print. Dr. Schumacher's subject was: 'On Bronze Age Caches in Southwestern Germany.' For convenience or safety these caches were so located as easily to be found by the owner; often near some prominent natural feature, as a cliff or rock. They were sometimes placed in large pots or wooden chests, or wrapped in skins. Such stores include weapons, tools and ornaments of bronze; gold ornaments are rare. They make it possible to trace definite prehistoric trade routes. It has been determined, for example, that the source of supply during the early bronze age was the Danube valley, while later the imports were from northern Italy, Switzerland and France. Ancient roadways as well as mountain passes have been traced.

Dr. C. Mehlis discussed 'Burial Tumuli of the Pre-Roman Period in the Vorderpfalz,' including those of the late bronze age, Hallstatt and La Tène epochs; and Herr Welter, 'The So-called Mardellen of Lorraine,' dwelling sites belonging to the La Tène epoch. Professor H. Klaatsch's contribution, 'The Problem of the most Primitive Flint Artifacts,' aroused unusual interest. By way of demonstration, several hundred primitive implements from France, England, Belgium and Germany were displayed so as to form a geographic, as well as chronometric, series, as follows: (1) Puy Courny and Puy Boudieu, Aurillac (upper Miocene); (2) Chalk Plateau, Kent and Sussex (middle Pliocene); (3) Saint-Prest, France (upper Pliocene); (4) Britz and Rüdersdorf, Berlin; (5) Taubach; (6) Belgian Diluvium; (7) Eoliths from Chelles; (8) Vézère (Paleolithic). Professor Klaatsch had personally visited all the localities named, and had himself collected most of the specimens exhibited. He agrees with the views expressed by Rutot of Brussels, the ablest living exponent of the so-called eoliths of the Tertiary and Quaternary epochs. Many of the pieces, although not intentionally shaped, had evidently been utilized; others again were slightly altered so as to accommodate the hand, and still others showed definite series of retouches.

Dr. J. Nuesch gave the results of 'Recent Archeological Discoveries at Kesslerloch.' This important station has been known since 1874, when the north entrance was excavated. Very important discoveries have recently been made in the south entrance. These discoveries make it clear that Kesslerloch is older than Schweizersbild, another well-known station in which important finds have recently been made. From the view point of paleolithic art, Kesslerloch also stands preeminent among Swiss stations.

Nuesch has not only collected over 2,000 specimens of the paleolithic period, including wonderful pieces of sculpture and engraving, but also hearths with burnt bones of the mammoth, rhinoceros, reindeer and wild horse. Dr. Nuesch announced the further discovery of remains of a pygmy race at Kesslerloch. Those who attend the International Congress of Americanists to be held in Stuttgart next summer will have the opportunity of visiting both Kesslerloch and Schweizersbild as a part of the official program.

Worms has long been recognized as one of the chief historic cities of Germany, as well as the center of the Teutonic legendary period. Recent discoveries in the environs serve to place her in the forefront from the view point of the prehistoric also. To the researches of Dr. Koehl, chairman of the local committee, Worms is indebted for this new and proud distinction. His excavations cover a period of several years, and have to do with not only the burial places dating from various epochs of the neolithic period, but also with those of the Hallstatt, Roman and Frankish epochs. In anticipa-

tion of the meeting, he had uncovered just outside the city thirty or forty Roman and Frankish burials, as well as the remains of an ancient Roman roadway. The skeletons and funerary objects were left in their original positions until after our visit, when they were removed—the skeletons to the Berlin Museum, and all other objects to the Paulus Museum in Worms. Excavations of a similar nature had also been carried on under Dr. Koehl's direction at three other localities. Near the West-end School in Worms, we were permitted to see burials of the Hallstatt epoch; while at Monsheim and Mölsheim, a few miles to the west of Worms, neolithic burials and dwelling sites, belonging to three different epochs, were exposed to our view. Here the pottery belongs to three distinct types, as set forth in Dr. Koehl's 'Festschrift' ('Die Bandkeramik der steinzeitlichen Gräberfelder und Wohnplätze in der Umgebungen von Worms'), as follows: (1) An early geometric pottery, the so-called Hinklestein type; (2) the Spiral-meander type, and (3) a later geometric pottery or Rössener type.

The next meeting of the association will be held in Greifswald, and is to include on its program an excursion to the museums of Stockholm.

GEORGE GRANT MACCURDY.
YALE UNIVERSITY MUSEUM,
October 28, 1903.

SCIENTIFIC BOOKS.

SMALL'S FLORA OF THE SOUTHEASTERN UNITED STATES.

Two works, each of them a masterpiece in its time, have given us our principal knowledge of the plants of the Southern United States. The first, 'Elliott's Sketch of the Botany of South Carolina and Georgia,' appeared in 1821 to 1824. The second, 'Chapman's Flora of the Southern States,' was first published in 1860, and was issued also in subsequent editions with new matter in the form of appendices. All botanists will welcome Dr. John K. Small's 'Flora of the Southeastern United States,' the new masterpiece of southern botany. The book contains 1,370 pages, besides twelve pages of introductory matter, and describes 6,364 species—another illustration of the fact that we are living in a time of men who do things. It is interesting to note in this connection that the author, after giving us in these 1,382 pages the result of ten years' persistent labor, required only a modest twenty-five lines of preface to tell how he did it. The work will be especially useful to botanists in Mississippi, Louisiana, Texas and Oklahoma because those districts have been only imperfectly covered by the preceding floras, which were based chiefly on material from the South Atlantic states. The new work does not, it is true, profess to contain more than the plants east of the one hundredth meridian, but in fact we do find in it such distinctly desert types as the ocotillo, *Fouquieria splendens,* and the creosote bush, *Covillea tridentata.*

The book follows the Engler and Prantl sequence, the American Association nomenclature and the metric system of measurement. It also gives family names throughout a termination in -aceae, a practise which has already been adopted in the publications from the United States National Herbarium and which, it is believed, will meet with general approval. The name Brassicaceae, for example, is a much more orderly, suitable and significant designation for the mustard family than the name Cruciferae, and it is only the greater familiarity with the latter name which leads many botanists still to cling to it.

It has come to be generally recognized in the last two decades that the generic grouping of species would be much more convenient and significant if the looser genera, containing diverse groups of species, which had been fashionable during the preceding half century, were divided into genera each of which represented an evident genetic community. A subdivision of these loose genera has been going on for several years past in America and in Germany. In Dr. Small's new book this tendency has been carried to an extreme to