origin of the barrier by which this exclusion of the sea was effected, are as great in the one case as in the other, but in neither greater than the difficulties met in accounting for the other great fresh-water formation of the coastal plain—the Lafayette.

In the case of this Lafayette formation, two explanations of its origin have been offered, viz.:

(1) That it was deposited along the borders of the Gulf and Atlantic during a period of depression, when the shore line was at the landward margin of the formation, and that the deposit was, therefore, a marine or estuarine one.

To this the structure of the formation, its position upon a deeply eroded surface, and the entire absence of fossil remains appear to be well-nigh insuperable objections.

(2) That the materials were drifted down the channels of ancient streams, in places coincident in position with the modern streams, and were thus of the nature of alluvial fans. All this would naturally happen during a period of elevation rather than of depression. In Alabama, the Lafayette does not seem to be confined to well-marked channels such as Dr. Hilgard finds in Mississippi, but it appears to have been spread over the whole face of the coastal plain of the Gulf as well as of the Atlantic, reminding one of a coalescence of alluvial fans on a large scale, as they spread out upon the plain, much after the fashion of the ice of the Piedmont type of glacier as displayed by the Malaspina. This view of the genesis of the formation would account for many of the phenomena, and certainly for the absolute lack of all trace of fossils.

In the nature of their materials; beds of sand often intricately false-bedded and of bright colors; beautifully laminated and gaily colored clays; great beds of massive clays of every variety, white, gray, reddish, purple and variously mottled; in their structure and in the general impression which they make upon the observer in the field, the two formations, Potomac and Grand Gulf, are astonishingly alike, so that in the absence of fossils it would be impossible to distinguish the one from the other if both occurred in the same area. On the other hand, the Lafayette has a character of its own, different from either, and so well marked that the observer with any reasonable degree of experience will scarcely ever remain long in doubt as to its identity or be likely to confound it with anything else, even though it holds no fossils to guide him.

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ANTHROPOLOGY AT THE SOUTH AFRICAN MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, 1905.

ONLY a few communications were brought by the over-sea members, and they all had a bearing upon South African anthropology. The president's address presented a brief summary of our knowledge of South African anthropology and pointed out lines for future inquiry, with an urgent appeal for immediate and more thorough investigation in the field. Mr. Henry Balfour gave an account (illustrated by lantern slides) of certain musical instruments of South Africa, dealing more especially with the musical-bow group of instruments. Mr. E. S. Hartland read an elaborate paper on the totemism of the Bantu, in which he pointed out that the totemism of the Bantu had been of a type similar to that of the Australians and North American Indians, but that everywhere it has fallen into decay and become more or less replaced by ancestor worship, and concomitantly father-right has replaced mother-right. Professor F. von Luschan gave an abundantly illus-

trated lantern demonstration on artificial deformation in Africa. The majority of the deformations, he holds, have been introduced from elsewhere and form part of an extensive amount of cultural borrowing by Africa from the East; perhaps indigenous are 'tattooing in relief' and the deformation of the lips. A second paper by Dr. von Luschan dealt with the origin of the Hottentots; he came to the conclusion that they were originally of Hamitic stock, mixed with Bushman blood, and that they are not, as generally believed, a Bantu-Bushman hybrid. Miss B. Pullen-Burry read a paper on the social and political position of the American negro. This was the only paper which did not deal directly with South African matters, but it had a definite bearing upon problems that are exercising the minds of colonists. All remaining papers were by local authors.

Stone implements of various kinds and the flakes and chips which resulted from their manufacture are very numerously and widely distributed in South Africa, and are receiving the attention of several collectors, who are attempting to allocate them to the various periods and types recognized by European archeologists. The refractory nature of a given rock or the lack of skill of the operator has a marked effect on the implement; but apart from these there are certain methods of technique which characterize European implements of known relative date. A great diversity of forms has been found in South Africa and most of these forms can be perfectly matched by European types, and to this extent South African archeologists are justified in speaking of paleolithic or neolithic or of intermediate types. Mr. J. P. Johnson, of Johannesburg, even goes so far as to distinguish eolithic types in South Africa, or at all events types intermediate between eolithic and paleolithic implements. Technique is, however, a very different matter from chronology, and until the stratigraphical evidence has been more satisfactorily studied it would be rash to speak of a South African paleolithic period as being necessarily synchronous with that of Europe; but our South African colleagues are thoroughly alive to this point. A further problem is the racial affinities of the makers of the stone implements, and here again evidence is slowly being accumulated. We had papers by Messrs. L. Peringuey and J. P. Johnson on these subjects, and they exhibited many types of stone implements.

A paper on the arts and crafts among the natives of South Africa by Dr. S. Schönland conveniently summarized our knowledge on the subject. This was followed by a paper by Mr. W. A. Squire on the art of Bushmen, which was illustrated by the exhibition of copies of Bushman paintings; these, and some other drawings that were exhibited, were a revelation to us all of the spirited and realistic skill of these clever draughtsmen.

The remaining papers by government officials and missionaries dealt with the ethnography of various Bantu peoples. Among the more important of them were the following: One on the mental characteristics of the Bechuana, as deduced from a study of their language by the Rev. Canon Crisp, threw a new light to many of us on the intellectual capacities of these people and on their extraordinary command of language. Mr. H. E. Mabille presented a valuable memoir on the Basuto, an interesting tribe that still retains some measure of independence. M. Junod, who has already published two valuable works on natives, gave us an account of the Thonga tribe and still further enlivened his bright paper by singing native songs; he also provided a native to sing and play upon a xylophone. The Rev. W. C. Willoughby read an instructive paper on the totemism of the Becwana. The totem was a sacred

animal, an old and tried friend; its worshippers (if we may call them so) did not hunt or eat it or wear its skin, but avoided it as far as possible; they sang songs and danced in its honor. In the old days there is no doubt that the totem was regarded as the supernatural friend and ally of the tribe; it was respected and protected and men swore by it as by a sacred thing; but this sacredness had begun to vanish before the white man came. There is no trace in philology, customs or folk-lore of any sacrificial rite connected with the totem animals of these tribes. The author described customs associated with useful plants and domestic animals which, in his opinion, were connected with totemism; an account was also given of the girls' initiation ceremonies, in which it is evident there is a close connection between food and sexual relations.

Very interesting was the account given by Mr. C. A. Wheelwright, C.M.G., on the circumcision lodges of the natives of the Zoutpansberg district of the Transvaal. It is extremely difficult to get any information on this subject, so these 'Notes' are of especial value. The lodges usually last three months and public opinion forces the youths to attend. The lads are taught to sing, dance and drill, sexual matters are fully gone into and the laws and customs of the tribe are inculcated; they are subjected to cold, whipping and privations to harden their physique and make them manly.

The Rev. E. Gottschling gave a sketch of the history and customs of the Bawenda. The Bawenda inhabit the northeast corner of the Transvaal, between the Limpopo and the Levuva, but it is not yet known where was the original Wenda, the cradle of the tribe; the people, who are typical Bantu, apparently come down from the lake district of eastern Africa. Owing to their mountainous country they have been little affected by outside influences. The mountain kraals are protected by stone walls six to eight feet in height and from four to six feet thick at the base; the two faces of the walls are carefully built, the intermediate space being filled up with earth. The huts of the chief occupy the highest terrace in the kraal. Near the entrance of a chief's kraal is an oblong, fortress-like, walled enclosure, or *tondo,* which is the 'school' where the initiates are made into men, and in times of unrest it serves as a watch-house for the town guard. In the *tondo* stands a little round shed in which all the fetishes of the tribe are kept, together with a carved wooden image of their totem and images of a man and his wife; these are carved in ebony and are about two feet in height; they are called *votambo,* or 'feast.' The Bawenda have a dim idea of a Creator, *Kosane* his executive officer is the god *Ralowimba,* and *Thovela* is a benign mediator. They pray at the annual sacrifices to *Modzime,* who is the totality of the good souls of their ancestors with the founder of their tribe as head and the ruling chief as living representative. Prayers at these sacrifices are never directed to the three gods above mentioned, but always to the ancestors; but in every-day life they pray to *Ralowimba.* Three phases of religious development are here seen existing at the same time: totemism, ancestor worship and the acknowledgment of gods. These people would repay a more careful study as it is possible that they are connected in some way with the erecters of the stone buildings of Rhodesia.

Mr. I. Randall MacIver, of Oxford, gave a lecture on the ancient ruins of Rhodesia, which he had been commissioned to report upon to the British Association. These widely spread and most interesting ruins have of late received a considerable amount of attention, especially Zimbabwe, the most elaborate of them all. The generally accepted view is that the oldest of them were

built by, or under the direction of, a Semitic people, the favorite idea being that these forts protected the old mines from which King Solomon obtained his gold. Mr. MacIver was bold enough to express the opinion that there is no evidence that strangers erected or directed the erection of these buildings; indeed, he believed they were entirely of native origin and were, as a matter of fact, more or less specialized chiefs' kraals. Further he stated that no proof has been produced that any of the ruins are more than a few hundred years old and he frankly speaks of them as medieval. This problem has thus entered upon a new phase, and we may expect a lively discussion in consequence.

Although, taking them as a whole, the papers read before Section H were well up to the average merit, or indeed above it, of papers presented to this section at previous meetings of the British Association, the value to the anthropological members of the South African meeting was immeasurably greater than has hitherto been the case, for it has been one long demonstration in the field of the social life of various races of mankind and of their relations with each other.

We came into contact with a large number of government officials of every rank in the several colonies, as well as with missionaries and others, and from them we were able to obtain a considerable amount of definite information concerning natives and the way in which they are governed. At first it is somewhat bewildering to note the different ideals concerning the native question and methods of treatment of the natives by the governments of the different colonies and protectorates. These are set forth at length, and with many contradictory conclusions by individual witnesses in the four volumes, 'Minutes of Evidence,' of the South African Native Affairs Commission, 1903–5. The 'Report' itself sums up a good deal of the evidence and gives the conclusions to which the commissioners have arrived, and it will not fail to prove of interest to sociologists in the United States who are concerned with somewhat analogous problems. We had no time to enter fully into the native problems of the several colonies, but we learned sufficient to enable us to approach these problems with more appreciation of local conditions than was previously possible, and we are less likely in the future to settle the problems to our own satisfaction in an off-hand manner or in a purely academic spirit. One can not help feeling that it would be worth while for a deputation of representatives of various colonies of South Africa to visit the United States of America with a view to seeing what has been done, wisely or unwisely, in the past with regard to the negro problem, and to note the trend of public opinion; since the experience of the United States may prove immediately beneficial to South Africa in some respects and also save future trouble.

The native question in South Africa presents many aspects. In Cape Colony there is a large population of half-castes which is practically absent elsewhere. In all the colonies the natives are numerous and very prolific. Some tribes are still under the old tribal system, but in other communities this has been destroyed. A few natives live in towns, many in locations near towns, where they are massed for labor purposes in a somewhat similar manner to the compounds in the mining centers, with the exception that in the latter, wives and families are absent. In the native reservations the natives are allowed great freedom and they live their lives in the old manner so far as the altered conditions of the dominance of the white man, the diminished authority of the chiefs and the destruction of their cattle by rinderpest and red-water fever permit; some of these

communities are under direct missionary influence, others are almost untouched by foreign teachings. Questions of present importance are: To what extent shall these natives be educated? How can they best be made to contribute to the industrial development of the country? How much should they contribute to the revenue? What is to be their social status? Are they to have representation in Parliament, or are native councils to be instituted, and, if so, on what basis? or Are they to have no representation at all? The government, capitalist, missionary and colonist have usually very diverse opinions upon most of these points and we shall await with interest the compromises that will have to be made. A factor that complicates some of these problems is the spread of the Ethiopian Church, the socio-religious propaganda of which is largely directed by emissaries of the African Methodist Episcopal Church of America, and this movement may readily take political aspects which would require careful handling.

The older colonies of Cape Colony or Natal contain a large oriental population, 'Malays' and Indians. As a rule these communities keep largely to themselves and do not intermarry with other nationalities. The Indian element seems to be increasing in Natal and is going to prove a serious problem as the coolies and traders can undersell white men. From information obtained in Natal, it would seem that the Indian coolies who were introduced to labor on the sugar estates start market-gardening on their own account and they can afford to give a higher rent for land than its value for growing sugar cane; if this spreads land-owners will let the land to the Indians and the sugar industry will suffer; thus there is a danger that the Indians may destroy that very industry they were introduced to foster.

The experiment of the introduction of Chinese labor into the mines of the Transvaal is being watched very carefully, and already a diversity of opinion is being expressed by those who are most interested in the problem; the two main issues being economic and social, (1) is it economical from the point of view of wages and output? and (2) is it desirable to introduce a new alien element into the colony?

Besides these sociological problems that are more immediately concerned with colored men, there are others confined to the white races. The last word has not yet been said on the relations between the Boers and the Britons, or between the transitory agents of capitalists and the colonial who makes the country his home. We were able to see something of the social effects of mining centers, of distributing and agricultural communities, as well as of frontier townlets, recent towns of great size, and long-established towns. Wherever we went we were confronted with insistent social problems of very varied character which ranged from the native savagery to the latest phase of civilization.

With such a field it does seem a pity that there is no central bureau or institution where information could be amassed and the multifarious problems studied. There is practically no systematic study of the natives anywhere in South Africa, so the great amount of individual knowledge which undoubtedly exists among many local persons is either unrecorded or uncoordinated when recorded. Thus South Africa affords a most favorable field for the study of the ethnology of the lower races and the sociology of the higher.

Local ethnology is inadequately represented in all the South African museums, and if the museum authorities do not bestir themselves it will soon be very difficult, if not impossible, to make exhaustive collections, for changes are taking place with great rapidity. Museums are expensive

institutions, and as South Africa is undergoing a period of financial depression the present does not seem a favorable opportunity for asking for increased expenditure; but the need of collecting is so pressing that it should be undertaken immediately, even if the specimens can not now be exhibited.

The native departments of various colonies and of Rhodesia took a great deal of trouble to assemble natives for the inspection of members of the section and it is due to their thoughtful efforts on our behalf that we were able to examine, measure and photograph representatives of many of the tribes of South Africa. Prison authorities also gave us facilities and by these means Bushmen, Hottentots and representatives of various Bantu-speaking peoples were studied. The compound managers at several mines likewise gave special opportunities for the examination of native laborers and our hearty thanks are due to all these gentlemen for their kindness.

The managers of the large sugar factory at Mount Edgecombe, near Durban, entertained a large party and organized a series of native dances on a very large scale. A similar treat was two days later provided by the Natal government at Henley, near Pietermaritzburg, where some 2,000 or more natives danced war and other dances for our delectation. These were very remarkable performances; many old residents had never seen the like and it is improbable that they will ever be repeated on a similar scale. At Henley the opportunity was taken to celebrate the marriage of Mhlola, the young hereditary chief of the Inadi tribe of Zulus, to a young woman whom he had selected to become his chief wife and mother of his principal heir. The ceremony was very lengthy, but it was most interesting; the *lobolo,* or bride-dowry, consisted of ten head of cattle. An elaborate dance of a large number of representatives of various tribes was organized by the authorities of the Village Main Reef Mine at Johannesburg.

Small parties of those specially interested, by private arrangement, made visits to several Zulu kraals in Natal and had an opportunity of seeing the native at home. Much insight into the life of the natives was obtained, which will enable us to study the literature on these people with increased appreciation. The Rhodesian government gave us similar facilities, and it was owing to its generosity and to the kindness of several officials that we were able to make long excursions from Salisbury and Umtali to visit Mashona and other kraals. These villages differ very considerably from those of the Zulus, as the Middle Bantu people of South Africa belong to a different stock from the Eastern or Zulu-Xosa stock; and a comparison between the two types was very instructive. Small collections were made at these kraals and many photographs were taken. Information was also obtained on special points from the elder men, with the assistance of the government official who accompanied us. On a rapid excursion of this kind very little real work can be accomplished, but general impressions were gained and previous accounts verified, and thus great benefit accrued to the visitors.

The voyage home was not without its valuable lessons. In Portuguese East Africa we witnessed a barbaric dance in the middle of one night, and at Beira, Mozambique, and Mombasa we visited three types of coast towns and saw various types of natives. Finally we finished off with a day or two in Egypt and noted the medley of races in Cairo—a veritable ethnological kaleidoscope.

Our extensive, though rapid, tour through and around Africa enabled us to see samples of nearly all the races and of many of the

tribes of that continent, and in this way it proved to be a very valuable demonstration in comparative ethnology.

ALFRED C. HADDON.

SCIENTIFIC BOOKS.

The Coral Siderastrea radians and its Post-larval Development. By J. E. DUERDEN. Washington, U. S. A. Published by the Carnegie Institution. December, 1904. Pp. 130, with 11 plates.

This handsome Carnegie memoir contains the record of an investigation begun at the Institute of Jamaica and subsequently carried on at the Johns Hopkins University and the American Museum of Natural History in New York. The author's prolonged residence in the West Indies gave him unusual opportunities in the way of command over living material, and the memoir makes valuable additions to our knowledge on many points of coral morphology.

An introduction deals with the systematic zoology and the habits of the species which is abundant and accessible in Kingston harbor. The form is obviously one of those convenient hardy types destined to play a part in laboratory investigations of histological and physiological character. Both the adult colony and the young polyp after metamorphosis grow in confinement and may be hand-fed. There follows an ample description of the anatomy of the adult. The species, like other West Indian corals, is possibly protogynous, although Professor Duerden calls to mind that Gardiner has established the converse phenomenon, protandry for *Flabellum*. Duerden takes up the question as to the way in which the coral skeleton, as a product of cellular activity, is produced. He confirms Miss Ogilvie's observation that the corallum can be seen in favorable parts of the adult and young polyps to be composed of minute skeletal units of a polygonal shape and exhibiting a fibro-crystalline structure. But whereas Miss Ogilvie interpreted these bodies as actual cells which were produced through the proliferation of the ectoderm, becoming calcified as fast as produced, Duerden regards them as secretory products which are laid down wholly external to the ectodermal cells. In support of this view, essentially that advanced by von Koch, Duerden finds that the layer of ectoderm concerned in the production of the skeleton is always a simple layer, and that, moreover, it is always separated from the corallum by a homogeneous mesoglœa-like stratum. It is in this stratum of homogeneous matrix that the author believes the calcareous crystals forming the skeleton are first deposited.

A third section deals with the post-larval development. The larvæ, of the usual coral type, were obtained in July, and were kept under continuous observation for some months after attachment. Many valuable facts concerning the succession of the tentacles, mesenteries and various parts of the corallum are recorded in this section. A feature of interest lies in the attention paid to individual polyps. The partial transparency of the young animal permits of instructive views during life, and thus in one and the same individual the correlated development of the various organs could be followed from day to day. A result of this method was that periods of rapid growth and relative rest could be distinguished. The author points out that a phylogenetic significance possibly attaches to some of the more persistent stages, such as, for instance, that in which complete pairs of mesenteries (directives) are found at the two ends of the œsophagus, with two pairs, each consisting of a long (complete) mesentery and a short one, on each side of the œsophagus. This condition continued unchanged for a period varying from three weeks to three months. The author's theoretical views as to the meaning of this particular stage are summed up as follows:

> The long retention of freedom of the fifth and sixth pairs of protocnemes suggests to my mind an ancestry in which the mesenteries as a whole, including the metacnemes, were alternately long and short, excluding, of course, the axial directives. Among modern examples this is retained in the mesenterial system of the zoanthids, *Porites*, and *Madrepora*, and was perhaps characteristic of the Rugosa.