

pology. Other papers were read on Maori folk-lore and studies on various southern languages.

'The Influence of the Southern Ocean on Australasian Climates' was the presidential address of Professor Gregory in the geography section. The effect of oceanic circulation upon weather conditions and the occurrence of weather cycles were the two points most strongly insisted on. Mr. Bowen gave a highly interesting account of the work of the *Discovery* in the South Seas, illustrating his remarks by lantern slides prepared from photographs taken by the expedition.

Agriculture in Section G2 dealt with highly practical matters. The president, Mr. Cato, chose for his subject 'Pomology.' Mr. Gilruth read an important paper on 'The Effect of Injection of Non-pathogenic Cultures with Virulent Ones of Anthrax.' He showed that the anthrax was under certain conditions rendered quite innocuous by this means.

In the architectural section the president, Mr. Deane, dealt with 'Day Laborers on Government Works.' This attracted much attention because of the many instances of colonial governments doing their own contracting.

In the sanitary science section Dr. Tidswell, in dealing with the hygienic action of boric acid, spoke strongly of the deleterious effect that this acid has even when used in small quantities as a preservative of dairy produce.

The education section was the best attended and a larger number of papers was presented to it than to any other section. The discussions evoked in many cases were animated. The president dealt with elementary education in Queensland, and there were papers on the teaching of modern languages, mathematics, geography, etc., and the discussions will probably do

much towards the adoption of modern educational methods in Australasia.

Besides the formal meetings of members the association had provided numerous excursions to the many points of scenic or scientific interest in the neighborhood of Dunedin. The botanists were much interested in the abundance of the endemic New Zealand flora still to be found near the town. The geologists viewed and collected from the outcrops of the rare and peculiar alkaline rocks that occur in the Otago Peninsula in such profusion.

Several of the leading citizens of the town entertained the visitors by drives into the country and at afternoon parties at their residences and enabled the workers in various branches of science to meet in social intercourse.

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#### SCIENTIFIC BOOKS.

*Aboriginal American Basketry: Studies in a Textile Art Without Machinery.* By OTIS TUFTON MASON. From the Report of the U. S. National Museum for 1902, pp. 171-548, with 248 plates. Washington, 1904.

A number of influences have been operating for ten years or more to arouse an interest, both scientific and popular, in the basketry of the American Indians. Our museums have sent their representatives far and wide in the search for types, and the competition of private collectors has resulted in a species of basket hysteria which shows no particular signs of abating. This interest, however aroused, is widespread and real and has at last found fitting expression in the sumptuous memoir on the subject which has just appeared from the pen of Otis T. Mason. Professor Mason has long ranked as the leading American authority on primitive industries and technique and there was no one so well equipped as he to undertake the task of collecting and reviewing the results of the scattered studies which have recently been accumulating at a rapid rate. He has acquitted himself admirably.

Primitive basketry is of interest chiefly from two aspects, namely, method of manufacture and decoration. Both phases are considered in the present work and are naturally given the lion's share of attention, but nothing which has to do with the subject in hand seems to lie outside the scope of the book. From the mental attitude of the woman who weaves to the use to which her product is put, all is fish to the genial author's net.

Professor Mason's general point of view is geographical and wisely so. There is no other method which would permit a survey of the disparate phases of his subject without hopeless confusion. His classification, avowedly arbitrary and determined by the available material, is:

1. Eastern region: Canada, Eastern States, Southern States, Western States.
2. Alaskan region: Interior Alaska, Arctic Alaska, Aleutian Chain, Southeastern Alaska, Queen Charlotte Islands.
3. Fraser-Columbia region: Fraser drainage, Columbia drainage.
4. Oregon-California region: Southern Oregon, California.
5. Interior Basin region: Southern Oregon, California.
6. Middle and South American region: Mexico, Central America, eastern and western South America.

Varieties of basketry, materials used (including a botanical list by Mr. F. V. Coville), methods of manufacture, methods of ornamentation, symbolism, uses of basketry, distribution of types, collectors and collections, and bibliography are all treated in successive chapters and supplemented by a superb series of 248 plates, many of which are reproduced in color. The result is a monograph incomparably the best in the field and one destined to stand as a high authority for years to come.

It would be too much to expect a work of such compass to be equally good at all points and it must be admitted that some of the chapters are much more satisfactory than others. The author disarms criticism to a great extent, however, by his very frank recognition of certain shortcomings.

As indicated above, the two points of chief

interest are technique and ornament. In his chapters on methods of manufacture and distribution of types the author is at his best. They are both notable contributions to our knowledge. His descriptions of technique are so clear and accompanied by such a profusion of illustrations of stitches and weaves that little is left to be said. Similarly with the distribution of types. This is a matter of great ethnological significance and its treatment is thoroughly good. Museums and private collectors far and wide have been drawn upon for material, and the result is an exhaustive mass of information for which all ethnologists will be devoutly thankful.

With the sections on ornamentation and symbolism the author reaches his difficulties. These problems have been attracting attention for years. The development of geometric patterns from pictorial designs has long been recognized, and from the nature of the materials this geometric ornamentation reaches its greatest complexity in basketry. The main problem has shifted of late from that of how far geometric patterns have arisen from realistic designs to that of how far meanings are read into designs already conventional. That this latter is a widespread tendency is certain. Designs and types of designs are borrowed and borrowed widely and the symbolic significance of these same patterns on foreign soil is quite as rich as though totally different from that obtaining in the groups of their origin. Culture and temperament determine the meaning even if not the form.

The extent of this process is the present problem at issue and a necessary preliminary to its solution is an extensive study of the local distribution of types of patterns without regard to their interpretation. The tracing of pattern elements, say from California, northward through the Shoshapian to other stocks north and east would yield much. Such a research has never been made, and although he recognizes its necessity, Professor Mason does little more than touch upon it. It is greatly to be deplored that one so well fitted did not accomplish for ornament what he has done for technique, but the author's

explicit avowal that his primary concern is with the practical and not the esthetic stifles complaint while it leaves regret. Fortunately the splendid series of plates affords material for a study of this character which has never before been available to any one to whom our large museums are inaccessible.

Filled as they are with descriptive detail, Professor Mason's pages do not lend themselves to quotation in a notice of this character. The scope of his work has been indicated. Suffice it to say that it is a big book and a good book and we are grateful.

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*The Paleontology and Stratigraphy of the Marine Pliocene and Pleistocene of San Pedro, California.* By RALPH ARNOLD. *Memoirs of the California Academy of Sciences*, Vol. III., pp. 420, pls. 37, 4to.

This memoir is the most important contribution to the invertebrate paleontology of the west American Cenozoic that has appeared since the publication of Gabb's 'Paleontology of the California Survey.' The author has worked very carefully over both the stratigraphy and the paleontology of the marine Pliocene and Pleistocene of California, obtaining more satisfactory results than have been reached by previous workers in paleontology. The field and laboratory work upon which the paper is based occupied the author for a large part of his time during nearly six years and every problem which presented itself has been carefully worked out to the minutest details. The paper was prepared at Stanford University, where the work was carried on under the able supervision of Professor James Perrin Smith.

The memoir is divided into two main divisions: Part I., a general discussion of the stratigraphy, faunal succession and faunal geography; Part II., a purely zoological discussion of the numerous forms represented in the faunas. Over four hundred species of invertebrates were obtained and this large number gives more than ordinary weight to the conclusions drawn by the writer.

The Pleistocene formations occurring at

San Pedro have been designated by Dr. Arnold as the San Pedro series. This is divided into an upper and a lower division, which are separated by an unconformity. The fauna of the lower San Pedro includes 247 species, of which 12.5 per cent. are extinct. Of this number 64 per cent. of the species are now living at San Pedro, 17.4 per cent. are living only north of San Pedro, 3.2 per cent. only south of San Pedro. The conclusion is drawn that this is a cold-water fauna. The upper San Pedro fauna includes 252 species, of which 9.5 per cent. of the species are extinct. Of this number 68.2 per cent. are now living at San Pedro, 6.1 per cent. only north of San Pedro, 14.2 per cent. only south of San Pedro. The fauna of the upper San Pedro series more nearly resembles that found living on the Pacific Coast two or three hundred miles south of San Pedro. In other words, this is a warm-water fauna.

In addition to a careful discussion of the extensive series of species described from San Pedro, the author has studied a large number of other Pleistocene localities on the coast of California and has presented a valuable correlation table.

The author makes an interesting comparison of the faunas of the Californian and Japanese coasts in Pleistocene time, and has brought out the fact that the relationship was much closer then than it is now. As the lower San Pedro fauna of California is boreal, it is to be supposed that the northern fauna would also push down the Asiatic coast. In addition to this, the presence of a broad submarine shelf would make possible the interchange of species.

In Part II. of his paper Dr. Arnold has described many new and important species. He has made an equally important contribution in the redescription and figuring of a large number of species which have never been satisfactorily described or figured. This portion of the memoir will be of almost as much value to students of recent and Tertiary faunas as it will be to those who interest themselves in the life of the Quaternary.

The author and the editorial staff of the California Academy are to be congratulated