not, however, because of the material and its manner of presentation, but because of the present unsatisfactory grouping of these organisms. Dr. Schutze had made the best of the material at his disposal.

Taken as a whole, the volume under notice will be welcomed by all bacteriologists. It should find a place in every medical library, and to the bacteriologist it will be a most welcome guide in all aspects of his work. Authors and editors are to be congratulated on this production. J. M. BEATTIE.

Petroglyphs of California and Adjoining States.

University of California Publications in American Archæology and Ethnology. Vol. 24, No. 2: *Petroglyphs of California and adjoining States.* By Julian H. Steward. Pp. 47-238 + plates 22-94. (Berkeley: University of California Press; London: Cambridge University Press, 1929.) 2.50 dollars.

THIS publication is issued by the Department of Anthropology of the University of California. It contains much that is of great interest to the student of primitive art, for it is concerned with a quantity of drawings which occur throughout California, being mostly executed on vertical rock-surfaces. There are both carvings and paintings, consisting for the most part of highly conventionalised figures of men and animals as well as what can only be classed as geometric patterns, and the whole forms a most interesting art group.

Although the rock drawings of California itself are the author's chief concern, he has included in his survey those found in neighbouring States, since, naturally, modern political boundaries did not affect the primitive artists. After a brief introduction, there follow short accounts of nearly three hundred sites where drawings occur. These are largely based on materials (now in the care of the Department of Anthropology at the University) which were generally the contributions of private individuals. The author has, however, studied a number of sites himself and his work is far from being purely one of compilation. Next an analysis of the art is given, and the various types of figures to be found are duly classified. Distribution maps show that while certain types of figures occur throughout the area, others occupy a more limited field. The paintings, it appears, are almost entirely confined to the south-west of the area under discussion.

This analysis probably makes the most interesting reading in the whole volume. The human form is represented again and again, and many of the conventions and symbols used in similar art-groups in the Old World are to be observed here too. Naturally, this does not necessitate any cultural connexion between, say, the Copper Age artists of southern Spain and these American draughtsmen of a probably very different date. But it is interesting to note in the New World a similar desire to symbolise and, resulting therefrom, the occurrence of very similar symbols. This is not difficult to explain, however, for conventionalisation in the sense in which we are using the word means the selection and emphasis of certain salient features in the object to be represented and the suppression of all unessential details. For example, in the much older Upper Palæolithic art, conventionalisation also occurs, and such an object as a horse's head, seen 'full-face', is represented as a trident-like figure—to such an extent has the dropping out of detail reduced the picture—and we are left with two ears and the mane (the central prong of the trident) and length! It is therefore not unnatural to find that, given the desire to conventionalise the figure of a man, certain types of symbols appear in widely separated parts of the world. After all, there are only a limited number of symbol-forms to which the human shape can be reduced when treated in the manner just described.

The author hesitates to regard some of the symbols figured on p. 184 as being human-form derivations, but many of them can be matched in the Copper Age art-group of Spain with figures which undoubtedly represent men and women. Certain other figures were, he suggests, phallic symbols. He may be right, but a simpler explanation would seem to be that they are merely drawings of human beings in which the sex is indicated. Every Greek statue is not a phallic representation because the sex is obvious. The animals are, of course, more difficult to 'renaturalise', but some of the species indicated—including sheep—can be recognised.

The geometric patterns include zigzags, concentric circles, spirals, etc. These are of an especial interest, though once again correlations with similar figures in art groups in far-off parts of the world are rash and unwarranted—the number of *simple* geometric designs conceivable being very limited. In any case, however, the Spanish and North African counterparts of these geometric designs show differences which were not so apparent when we were considering the conventionalisations from life.

The author next considers the meaning of the art and its age. As regards the former, he rejects the notion that the drawings were purely decorative in intent, or executed to while away a chance half-hour. They are often found far away from settlement sites, and the Indians to-day, though professing to know nothing about them, nevertheless regard them with awe. On the whole, he seems to consider that they were connected with initiation ceremonies which take place at the age of puberty among many primitive peoples. The question of the age of the drawings cannot be answered with any certainty. Most of them probably date from the Basket-Maker to the Cliff-Dweller or early Pueblo culture. The drawings of the Santa Barbara district (where many of the paintings are situated) have, however, a very fresh appearance and would seem to be the most recent in origin.

In conclusion, there are no less than 94 half-tone plates. It is perhaps a pity that the carvings were almost invariably chalked before being photographed. The process of chalking is in general to be avoided for scientific purposes, since it allows the personal factor to come into the work. Rock carvings will almost always photograph well at those times of day when the sun's rays strike the figures obliquely, and a certain proportion of such photographs would have been very welcome in this volume. Altogether, however, this is a really excellent work, which should not be missed by students of American archæology or primitive art.

M. C. Burkitt.

The Geology of Great Britain.

Handbook of the Geology of Great Britain · a Compilative Work. Edited by Dr. J. W. Evans and Dr. C. J. Stubblefield. Pp. xii + 556. (London: Thomas Murby and Co., 1929.) 24*s*. net.

THIS handbook is a new and enlarged edition of the volume dealing with the British Isles of the "Handbuch der regionalen Geologie", published in Heidelberg about twelve years ago. The general plan of the work is the same as that followed in the German issue with the exception that Ireland is no longer included. The chapter devoted to the geology of the Channel Islands is retained. Seventeen geologists, all authorities on the particular subjects with which they deal, have contributed, and the task of editing the manuscripts must have entailed much labour; but the book makes a notable advance on the earlier volume, and the editors are to be congratulated on the successful completion of their work.

As was to be expected from the names of the contributors, the chapters devoted to the description of the Pre-Cambrian and Lower Palæozoic rocks are excellent summaries of the knowledge now possessed of these formations. A few minor discrepancies, however, may be noted in reading the accounts, but their presence in no wise seriously affects the subject-matter. For example, readers would be enlightened if the phrase "the term Caledonian has come into use in Goodchild's sense" (p. 31) were explained. One reads later (p. 142) that Goodchild used the term for a stratigraphical unit, whilst earlier (p. 2) one finds the more familiar use of the term to denote a system of folding. Again, some confusion is created by the use of the term 'southern Scotland' for southern Highlands (p. 33), more particularly since an unknown outcrop of Dalradian in Devonian is shown on the map (p. 37) as occurring somewhere near Lanark. Less important is the statement that E. B. Bailey accepts the Moine gneiss as altered Torridonian rocks.

The difficulty of keeping abreast with geological literature is probably responsible for the absence of any reference to the occurrence of rocks of Lingula Flags age in a borehole in Essex, and to the discovery of the pygidium of a trilobite (*Calymene* sp.) in the Stiperstones Quartzite. The specimen is now preserved in the Museum of Practical Geology, and an announcement of its presentation was made in 1918.

It would seem that much further study is necessary before the classification of the rocks grouped under Downtonian is finally decided. In the Silurian chapter, an excellent summary of the previous investigations is given under the heading Downtonian, with the provision that it is as yet premature to decide whether the rocks should be regarded as belonging to the lower part of the Devonian system or retained as the upper members of the Silurian. In the brief description of the Downtonian in the Devonian chapter, however, we read that the Downtonian "may be considered to represent a passage from the Silurian to the Old Red Sandstone" (p. 138). It is perhaps not necessary to make further comment on this question of classification at the moment, but my own experience of these beds on the Welsh borderland lends support to the view that the Ludlow Bone Bed forms a natural base to the Devonian System, as advocated by Dudley Stamp and other workers.

By far the most notable contribution to the volume is that made on the Lower Carboniferous rocks. It is concise, lucid, and informative, and