

analysis of the conditions prevailing and determining the precise local distribution of species and communities, including the changes taking place in the arrangement of the vegetation by colonisation and invasion.

In the various sections of the volume under review, interspersed in the discussion of general principles, we find many interesting details regarding certain species that we can piece together. For instance, we learn that the giant cactus, *Cereus giganteus*, which raises its fluted columnar stem up to a height of fifty feet, was shown by Mrs. E. S. Spalding to act as a vast expanding and contracting reservoir, as its ribs and furrows permit of bellows-like action. This plant, like some other desert-plants, possesses extensive shallow roots, which are very efficient collectors of water derived from feeble showers; for Mrs. Spalding found that after a rainfall of 0.5 inch "the stems expanded steadily for three weeks." Such a slight fall of rain would cause an appreciable increase in moisture only to a depth of less than four inches, so that the utility of shallow roots is clearly demonstrated, although so many desert plants have extraordinarily deep, relatively unbranched roots. In connection with the ques-

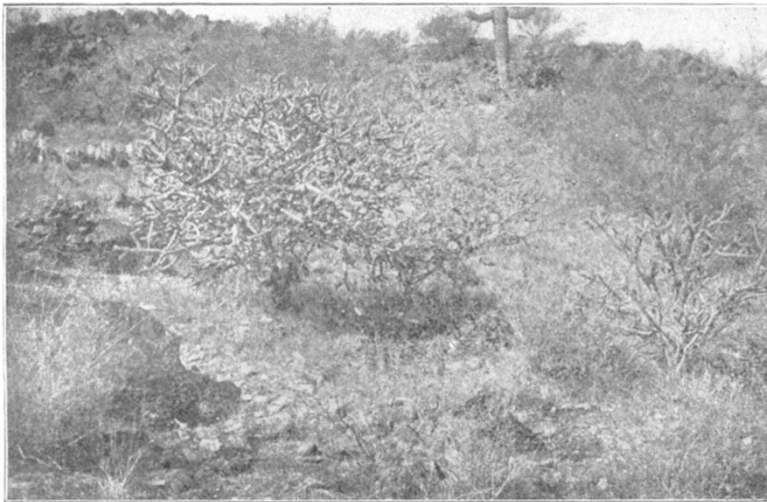


FIG. 2.—Left side of gulch near Laboratory, with generally north exposure.

tion of water supply, Dr. Livingston, in his valuable article on the soils, shows by means of curves that the effects of atmospheric precipitation on moisture in the soil regularly "lag" behind the actual falls of rain, so that, with certain depths of root, the plant does not immediately profit by showers, nor does it suffer, *pari passu* with absence of rain, from lack of supply of water. To return to the consideration of *Cereus giganteus*, Mr. J. C. Blumer clearly shows that individuals of this species, as of certain others, are more numerous on the southern slopes of hills. Inasmuch as other species show a preference for the more favourable northern slopes, there is a difference in the vegetation of the different sides of hills or gulches; and it is shown that on the northern side of the latter the difference tends to become accentuated with time, because the more numerous individuals and species present tend to cause an accumulation of humus and a consequent amelioration of the soil.

The section of the volume dealing with the geology of the desert, written by a geologist, Prof. Tolman, seems in subject-matter rather out of place, as it abounds in diffuse and irrelevant generalities. Among these the statement that "Europe is behind America

in the study of these newer phases of geology" would perhaps have been nearer correctness a dozen years ago.

One chapter differing from the others in being not particularly applied to Tucson desert is that on the origin of desert floras, written by Dr. D. T. MacDougal, who deals rather with the possible mode of evolution of biologic types than with the origin of the desert flora. He affirms that consideration of the known facts "leads to the inevitable conclusion that the form-characters, moisture-conserving capacities and resistance to desiccation, distinction of xerophytic species, must have made their appearance within comparatively recent geologic time." In the light of the geological evidence suggesting the former existence of deserts, and in view of the difficulty of geological preservation of the remains of desert-plants (except in oases or by rivers), such a conclusion seems open to the gravest doubt; and scepticism as to its correctness will be heightened by our knowledge, not only of the existence of xerophytic Cryptogamia and Phanerogamia of all ranks, but also of the distribution of such remarkably isolated types of desert plants as *Welwitschia* and *Acanthosicyos*. An additional

consideration militating against Dr. MacDougal's conclusion is that xerophytic characters are evolved with considerable facility, as is demonstrated by the fact that various xerophytic communities (in deserts, for instance) in different parts of the world generally include a relatively large number of endemic forms that are definitely allied to and derived from the adjacent non-xerophytic flora.

In congratulating Mr. V. H. Spalding and his collaborators on this valuable contribution to our knowledge of the ecology of desert-plants, and on supplying ample justification for the foundation of a desert laboratory, we may perhaps be forgiven for adding a prayer to American botanists that when they use local or popular names of plants, they will, at least on first mention of these, also give the botanical names.

The omission of this precaution causes botanists of other countries to lose more than time in the endeavour to learn what plant is being referred to. For instance, early in the volume under review, reference is made without any explanation to the "sahuaro," the "creosote-bush," "cotton-woods," the "ocotillo"; yet few, if any, European botanists would know the identity of all these, or that these names represent respectively *Cereus giganteus*, and species of *Larrea*, *Populus*, and of—the reviewer imagined that he remembered the generic name of the last, but has been compelled to interrupt this sentence and waste ten minutes in fruitless search.

PERCY GROOM.

NUBIAN ARCHAEOLOGY.¹

THE first publication of the Egyptian Department of the Pennsylvania University Museum, under the direction of Prof. Randall Maciver, is one that shows great promise for the future. Thanks to the enlightened financial support of Mr. Eckley B. Cox,

¹ "Areika." By R. Randall Maciver and C. Leonard Woolley. With a chapter on Meroitic Inscriptions, by F. Ll. Griffith. Pp. 56+plates (Oxford: I. Lettnerpress and Plates printed by Horace Hart at the University Press, 1909.) Price 17. 15. net.

jun., Prof. Maciver has been enabled to initiate a programme of archæological exploration in Egypt which, if continued, will, under the leadership of this most competent archæologist, undoubtedly result in interesting and important discoveries.

Prof. Maciver has chosen for the scene of his work a portion of the Nile valley which has hitherto seemed most unpromising, the barren Nubia that lies between the first and second cataracts. The nature of the country, in which the river flows practically through desert, with only the narrowest fringe of cultivation along its banks, seemed to deny the possibility of any important ancient centre having been established there, and the temples that were erected by the river-side seemed to be the memorials more of Egyptian imperio-religious pride than of real civilising energy. There

liminary tour of his Nubian district, which resulted in the publication of a careful and detailed report on the archæological probabilities and possibilities of Nubia. Then the Survey Department started a thorough and comprehensive exploration of the whole district (including excavations under the direction of Dr. Reisner and Mr. Firth, which began its labours at Shellal, and is now slowly working southwards).

Independent explorers were also summoned to the work. Prof. Garstang, of the University of Liverpool, carried out a season's work at Koshtanneh which was productive of interesting results. Unluckily, it has remained a *ἄπαξ λεγόμενον*. Prof. Garstang was drawn aside from the comparatively dull antiquities of Nubia to the more beautiful trophies to be found in the necropolis of Abydos, but he has now turned



Nubian Castle near Amada: Period of Thothmes III. View looking from the North-east Corner. From "Areika."

is little doubt that no serious attempt to seek for remains of antiquity in this region would have been made even now had it not been for the fact that the proximate raising of the level of the Aswân Dam threatened the drowning of the ancient banks for a considerable distance upstream, and the consequent destruction of any historical evidence that might be buried near them. The attention of the Service des Antiquités, the archæological branch of the Egyptian Public Works Department, was at once directed to the necessity of saving such historical evidence so far as possible, and the director-general of the Service, Sir Gaston Maspero, K.C.M.G., commenced the organisation of a general archæological campaign in Nubia. Mr. A. E. Weigall, the inspector of antiquities for Upper Egypt and Nubia, undertook a pre-

again southwards, to the Sudan, and time may yet bring him back to assist the researches of Mr. Firth and Prof. Maciver in Nubia. Prof. Maciver was last in the field, but has already made most interesting finds, which are described in "Areika," the volume under review. Assisted by Mr. C. Leonard Woolley, he has explored the region between Korosko and Amada, known as El Righa or Areika, which gives its name to the book. Here he has carried out three excavations; first, that of the castle of a Nubian chief of the time of Thothmes III., near Amada; secondly, that of a neighbouring cemetery of earlier date; thirdly, and most important of the three, that of a cemetery of Roman date at Shablul, opposite Korosko.

The Nubian chief's castle is a queer conglomerate-

tion of buildings of absolutely non-Egyptian and more or less negro type, showing all the negro's inability to think out or carry out a coherent plan, or produce any sensible building bigger than a simple hut. There is little doubt that the Nubian population is, and has always been, fundamentally negroid, and no doubt in ancient Egyptian days it was nearer the negro than it is now. The cemetery might, from the nature of the antiquities found in it, be dated to a period contemporary with the Egyptian predynastic period. But Prof. Maciver well points out that the barbaric culture of the Nilotes, which was raised and organised into a civilisation in Egypt before the beginning of the First Dynasty, continued in its primitive form in Nubia throughout history, and even now pottery not distantly akin to the prehistoric Egyptian is still made there. So that we cannot say that primitive remains in Nubia are necessarily primeval in date. This explains the phenomenon of the "Pan-Grave People" of the XIIth Dynasty in Upper Egypt. The isolated Egyptian settlements of this people, whose pottery is so closely analogous to that of the primitive Egyptians, but whose "Middle Kingdom" date is certain, were originally discovered by Prof. Flinders Petrie. They remained an enigma until Mr. Weigall discovered that the earlier Nubian cemeteries were largely of "Pan-Grave" type, and that "Pan-Grave" pottery was common there. It was then supposed that the Egyptian "Pan-Grave" remains were the relics of Nubian conquerors at the time of the XIIth Dynasty. Prof. Maciver, following up the clue, supposes in the present volume that the Egyptian "Pan-Grave" people were Nubian potters imported into Egypt to make their special pottery (which was, in its way, finer than that of the Egyptians). To me it seems more probable that they were not merely potters, and I would see in them simply colonies of deported Nubians, brought back by the conquering Pharaohs of the XIIth Dynasty as the "living prisoners," trophies of their Nubian razzias which are often mentioned in the inscriptions, and settled in vacant lands of Upper Egypt.

The discoveries at Shablul are of importance as definitely identifying the products of a peculiar art, long known and correctly identified as of Roman date (it is especially well represented in the collections of the British Museum), as Nubian. The later specimens of the painted pottery of this style clearly connect on to the crude productions of the Coptic potters, and this was always seen, but Prof. Maciver and Mr. Woolley have shown that the same style, which is Nubian only, goes back well into the Ptolemaic period. Its earlier products are quite Egyptian or Greek in the choice of motives, but throughout the whole series there runs a note of peculiar originality of treatment which can only be due to the Nubian potter himself. This painted pottery is splendidly illustrated by coloured plates which accurately reproduce the originals. Its decoration is extremely interesting, and the comments of the authors themselves on it are most illuminating. But to quote the opinions on it of professors of artistic style who are evidently not gifted with much historical sense was unnecessary: Prof. Meurer's opinion that a certain design of a crescent with a cross (a modification of the *ankh*, the symbol of life) on this Roman-Nubian pottery is a descendant of the Minoan Cretan motive of the Double Axe above the Horns of Consecration (so well known from Dr. Evans's discoveries at Knossos) is, frankly, absurd, and we wonder that our authors did not pass over it in respectful silence. As it is, their reviewers have to chronicle it with disrespectful mirth.

Prof. Meurer has supposed that the two designs are connected because they are alike, ignoring the absence of all known connecting links between them during

the space of a millennium and a half. The only possibility of the Nubian design being descended from the Cretan would lie in an Egyptian adoption and naturalisation of the Cretan design in the time of the XVIIIth and XIXth Dynasties; and though the Egyptians did for a time take over some Cretan artistic ideas, they never took over the idea of the Double Axe above the Horns of Consecration; and naturally they did not, because they did not take over the worship of the Cretan gods, whose symbols these were (though cults akin to those of Crete may have been known in the Delta at an early period). We prefer our authors' own ideas without those of Prof. Meurer. Throughout their work they themselves had made only one remark which calls for criticism—the description of the *ankh*, the symbol of life, as the "Nile-key." The *ankh* was not a key, and had nothing to do with the Nile. It was a conventional representation of a man's girdle, with the tied ends hanging down in front.

The book concludes with a paper on the inscriptions in "Meroitic" form of the Demotic script, of which many specimens were found by the explorers, and its relation to the Meroitic hieroglyphic inscriptions, by Mr. F. Ll. Griffith. Mr. Griffith here makes the first step to a decipherment of both scripts, and has established several curious and unexpected facts with regard to them. This discussion of the relation of their language to the Nubian of Christian times, lately studied by Profs. Schäfer and Schmidt, is very suggestive.

In conclusion, Messrs. Maciver, Woolley, and Griffith must be congratulated on the production of a most interesting contribution to a little-known branch of Nilotic (if we may not, strictly, say Egyptian) archæology.

H. R. HALL.

FROM THE CAPE TO CAIRO WITH A MAGNETOMETER.

DURING the last twenty years a great many observers have carried on magnetic work in different parts of Africa. A summary of the results up to 1900 at the Cape of Good Hope has been collected and published by Prof. Morrison and the writer,¹ and one for Northern Africa by Mr. B. F. E. Keeling;² since 1898 a magnetic survey of South Africa has been in progress; between that date and 1906 observations were taken at more than four hundred stations by Prof. Morrison and the writer, with assistance at one time and another from Mr. S. S. Hough, Prof. A. Brown, Prof. L. Crawford and Mr. V. A. Löwinger. A report by the present writer on the work during this period, including a summary of the earlier work in Africa, south of the Zambezi, was published for the Royal Society at the Cambridge University Press.³

Notwithstanding the considerable amount of work done, there was, and still is, a lack of magnetic data for great tracts of what is now no longer geographically the unknown continent. With the purpose of obtaining some information in parts magnetically unknown, the writer submitted, in 1907, a scheme of work through Dr. L. A. Bauer, director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, to the trustees of that body. In this scheme he proposed to continue the line of magnetic stations already occupied between Cape Town and the Victoria Falls to Gondokoro, on the Nile. North of that it was not deemed necessary to observe, as the Survey Department of the Egyptian Government had already put forward proposals for a

¹ "Magnetic Elements at the Cape of Good Hope." By Beattie and Morrison. (Trans. S.A.P.S., vol. xiv., 1903.)

² "Magnetic Observations in Egypt." By B. F. E. Keeling. (1908.)

³ "Report of a Magnetic Survey of South Africa." By J. C. Beattie. (1909.)