Prehistoric Art in Caves and Rock-shelters.

By M. C. BURKITT.

PREHISTORIC art is a branch of prehistoric archæology or prehistory, and, as a study, is comparatively new. Although the discovery of the Altamira paintings was made many years ago, their palæolithic age was not accepted until after Rivière's discoveries at La Mouthe (Dordogne). Rivière, in the course of digging out the Magdalenian deposits of this cave, discovered an entrance leading to a long passage behind. The entrance had been completely obstructed by undisturbed layers of the deposit. Man could only have entered the inner cave previous to the deposition of these datable layers. In the cave behind were found a number of engravings, many of them quite primitive, and a few paintings. Once the palæolithic age of these drawings was accepted, M. Piette recalled the then almost forgotten paintings of Altamira. The fact that animals like the bison were found painted there (*i.e.* animals long ago extinct in Spain) further vindicated their palæolithic age, and any stray sceptic was finally won over by M. Cartailhac, when he published his famous retraction.

Since the beginning of the present century a very great deal of work has been done and further discoveries have been made in this fascinating study of early art. Not only do all the recognised text-books on prehistory devote considerable space to this early art, but also a number of books dealing specially with the art itself have appeared. These profess to cover the whole development of the art from its first appearance until early historical or even later times. The specialist, however, generally finds that there is a certain lack of balance in books of this type, which is by no means the fault of their authors, but simply due to the fact that a very large amount of material, especially of Neolithic or Eneolithic age, has not yet been published. Practically all the work on prehistoric rock drawings or paintings has been due to the Abbé Breuil (professor at the Institute of Human Palæontology, Paris). All the drawings that we see in the popular books are reproductions from his tracings of the originals. But besides these there are a great number which he has not yet had time to prepare for publication. The present writer, who is a pupil of Prof. Breuil, and has travelled with him in Spain and elsewhere, has neither the space here nor the right to anticipate his future publications, but perhaps a general survey of the rock drawings and paintings from Palæolithic to Bronze-age times may not be out of place, as well as a brief account of some of the more important recently published discoveries that have been made.

The prehistoric art in Western Europe that is to be found emblazoning the walls of caves and rock shelters, etc., can be divided into six groups:—

1. The ordinary Upper Palæolithic cave paintings and engravings.
2. The Eastern Spanish style, rock shelter paintings of Upper Palæolithic age.
3. The Spanish third group rock shelter paintings of Neolithic and Eneolithic age.
4. The Western Scandinavian rock carvings and paintings of Late Neolithic and Eneolithic age.
5. The South Swedish Bronze-age group of rock carvings, with an outlier on the shores of Lake Onëga, North Russia.
6. The group of rock carvings, probably of Bronze age, that occurs high up on the flanks of Monte Bego, etc., in the Maritime Alps.

It may be well to discuss briefly each of these groups.

Group 1. The distribution of the ordinary Upper Palæolithic cave art depends first of all on the presence of suitable natural caves. This in turn demands the presence of limestone formations in the district. Secondly, it depends on whether the prehistoric tribes of the region employed this particular form of magic ritual to ensure a good success in hunting. These suitable conditions are found:—

(i) In Dordogne (France), especially concentrated round the little village Les Eyzies, on the River Vézère, some miles above where it falls into the River Dordogne.

(ii) In the Pyrenees, especially concentrated, so far as it is at present known, in the Ariège and adjacent departments.

(iii) In Cantabria and Asturias, North Spain, *i.e.* north of the Cordillera Cantabrica, that chain of mountains which forms a continuation of the Pyrenees along the north coast of Spain. Geographically, this region is South France rather than North Spain. The cave art here is specially concentrated near the town of Santander, which forms a good centre for visiting the caves.

(iv) A small series found in caves in South Spain. There is no doubt of the similarity of the art of this series and of the rest, but the apparent absence of the Upper Palæolithic cultures over the intervening Iberian Peninsula makes the actual connection rather obscure.

(v) In a single cave in the extreme south of Italy.

A proof of the age of this group has already been adduced, and there are others into which we need not go here. They would seem to have been executed for magical purposes, and this is shown from the following considerations:—

(a) The animals are often painted or engraved one on the top of another haphazard, which would not be the case if they were made for decoration.

(b) They are found in deep caves and often in obscure spots, difficult of access. At Niaux (Ariège) they are not found until the explorer

has penetrated half a mile into the hill. Man did not live in deep, dank caves requiring artificial light; his habitation was made under overhanging rocks on the sunny side of the valley, or occasionally in the mouth of a cave. These cave drawings, then, were not home decorations, and one could scarcely imagine a prehistoric man rushing half a mile into a hill with a blazing brand to light him in order to paint an animal in some narrow crack from mere *joie de vivre*. The only other explanation is that this art was used for some form of magic or ritual ceremonial. When we recall that the animals sometimes show arrows in their flanks, and when we find the human hand depicted (in one cave at any rate, mutilated by certain joints of the fingers being removed), not to speak of the presence of a number of queer signs at the meaning of which we can only guess, we are forced back to the conclusion that sympathetic magic is the sole explanation. A good catch is all-important to a hunting people,

figures of even a later date are sometimes placed in a fifth phase. The fact that the succession of styles is the same over such a wide area indicates either schools of tradition for the medicine men or priestly caste—*i.e.* for those who did the magic in the caves—or, at any rate, a fairly close intercourse between the various regions. This is still more startling in the case of decorated bones from the deposits themselves, where we find similar peculiar geometric decorations from Cantabria to the Ukraine.

In a new and unpublished cave there is the painting of a sorcerer masked as a stag dominating a frieze of engraved animals.

Group 2. The Eastern Spanish style. This is thought to be of Upper Palæolithic age, for the following reasons: (a) There is a painting of a bison at Cogul; of an elk at Cueva del Queso; of a chamois at Tortosilla (chamois have long ago disappeared from the province of Albacete, South Spain); of an elk, a reindeer, and a rhinoceros at

FIG. 1.—Panel in the second rock shelter at Cantos de la Visera (Albacete, S. Spain). Paintings in the Eastern Spanish group of horses, stags, bulls, etc.

and no doubt these paintings and engravings, that are so lifelike in appearance, were used to further this object.

All the drawings are not of the same age, and they can be divided into a number of phases of different ages. These phases are determined by a careful consideration of the various styles that are painted or engraved one over the other. When such a palimpsest occurs, the engraving or painting on the top is obviously newer than those underneath. When a number of caves in the various regions are examined it is found that the succession of the styles is the same, whether we are in Cantabria, in the Pyrenees, or in Dordogne. Of course, certain local styles make their appearance in various places, but the main succession is the same. Detailed studies have enabled us to assign dates to these various styles, and we can now confidently affirm that phase 1 is Aurignacian; phase 2, Lower Magdalenian; phase 3, Middle to Upper Magdalenian; and phase 4, Upper Magdalenian. Certain geometrical

the newly discovered rock shelter of Minateda (Albacete). (b) The figures of horses painted in the Eastern Spanish group at Cantos de la Visera are exactly similar in technique to a small horse painted in red among the northern group 1 at Portel in the Pyrenees. This Eastern Spanish style is peculiar in that it is found, not in deep caves, but under rock shelters, that are, however, deep enough to protect the paintings from actual moisture, which would give rise to moss growth that would soon destroy the paintings. The climate of East Spain is neither rigorous nor damp, and there is no reason why these paintings, made with oxides of iron as pigments, should not have lasted until to-day. Another characteristic of this group is the number of human beings depicted, often armed with bows and arrows. The most important discoveries made in this group in recent years are: (a) The rock shelter of Cantos de la Visera; (b) the rock shelter of Minateda; (c) the rock shelters of the Barranco de Valltorta (province of Castellón). The first of these was

discovered by the writer, and is of importance from the occurrence of horses, which have been compared with one at Portel (see above) (Fig. 1); also by the occurrence of two painted birds (a great variety at all times in Palæolithic art, and above all in the Eastern Spanish group).

Minateda is important from the great wealth of paintings found there, among which are animals long ago extinct in the region. There is also a battle scene of men fighting (Fig. 2). Prof. Breuil has been enabled, from a study of the superpositions of the paintings, to unravel a very large number of different styles. These do not seem, however, to indicate any very great difference in age, or, if they do, we have as yet no means of correlating them with deposits of Upper

FIG. 2.—Panel at the new rock shelter of Minateda (Albacete, S. Spain). It belongs to the Eastern Spanish style, which is of Upper Palæolithic age.

Palæolithic age, as the latter seem to be absent from East Spain.

The rock shelters of the Barranco de Valltorta are specially interesting for the number of painted human beings which they contain, exactly similar in style to those found in Bushman paintings. The resemblance is startling—in fact, a research student in ethnology at Cambridge, when shown pictures of these rock shelters without being told their provenance, turned away, saying, "Oh, yes, those are some more Bushman paintings." There are several hunting scenes depicted.

The object for which paintings of this Upper Palæolithic, Eastern Spanish group were made cannot be determined with the same degree of certainty as in the case of Palæolithic group 1; it

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is probable, however, that magic was at the bottom of it.

Group 3. The Spanish third group of Neolithic or Eneolithic age. This group comprises scores of rock shelters all over Spain. Examples are also found in East Spain alongside the older Spanish group 2. Where examples of both groups occur in the same rock shelter, the examples of the Spanish group 3 are always painted over, and are therefore newer than the Spanish group 2. The style is altogether different, whereas in the Spanish group 2 the animals at any rate are naturalistic, even if the human beings are more or less conventionalised. In Spanish group 3 there is no attempt at a naturalistic drawing at all; the animals are often similar to what a child of four would make, and even more simplified than this, while conventions for the human form are bewildering. For example, the human form is sometimes represented by a vertical line from which two pairs of oblique lines are drawn forming arms and legs, or by the painting of a sort of hour-glass, or by a circle with a vertical line drawn through it, or again by the letter "D" placed horizontally with a vertical line drawn from it and dividing it into two segments; an eye is often indicated in each of these segments; although these figures often seem but remotely to resemble a human form, a complete series from an unmistakable human being to the most conventionalised example can be made out.

This Spanish group 3 is widely distributed over Spain. In the south-west area limited by Cadiz, Gibraltar, and Bobadilla, there are more than sixty rock shelters decorated with this art. Further east there is a large group in the province of Almeria, with the little village of Velez Blanco as a centre. All along East Spain this art occurs, sometimes, as has been said, in the same rock shelters, with examples of the Spanish group 2. The Sierra Morena and its continuation towards Portugal contains numerous examples of this group, while further north, south-west of Salamanca, in the valley of Batuecas (mentioned by Borrow in his "Bible in Spain" as a weird place, full of queer legends), this Spanish group 3 art is found in conjunction with some small semi-naturalistic figures that are of rather earlier date.

As in the case of the Spanish group 2, this Neolithic or Eneolithic art is found painted on the walls of fairly shallow rock shelters. The shelter, however, must be sufficient to prevent the access of damp, which, by promoting the growth of moss, etc., would rapidly destroy the paintings.

Certain pots dug up from deposits, dated as being of Late Neolithic or of Eneolithic age, carry engravings of the human form, etc., conventionalised in the same way as those found in the rock shelter. Pots of this nature have been discovered by M. Siret and Don Federico de Motos in the province of Almeria, while Dr. Obermaier has described the same kind of thing from near Madrid. The discovery of these engraved pots enables us to date

the similarly conventionalised drawings of this Spanish group 3. Further, there is a painting of a man armed with a sickle, and another with what must have been a metal hatchet. Stone hatchets are, however, also occasionally figured. Again, a painting of a man occurs at Peña Tú, convention-

side of a prominent bluff, jutting out into a wide valley, made it eminently suitable for some form of temple, but the ritual could no longer have been a simple, sympathetic magic to ensure a good catch of game. Was there an element of real religion, and were these drawings, although

apparently not orientated one to another, of the nature of pictographic writing? The other example is near Velez Blanco, where there is a small rock shelter known as Gabal. It contains no paintings, but a niche over the entrance, reached to-day by a ladder, contains quite a number. Are these the sacred emblems of the household; a protecting *talisman* for the "Home" below?

Group 4. The Western Scandinavian engravings. This interesting group of rock carvings on hard, glacier-worn surfaces of rock is found fringing the western coast of Scandinavia from Narvik, in the north, to Vingen Fjord, in the south. Occasionally, when the mountains

of the interior open out, they are to be found stretching back, even into Sweden. They consist of a number of carvings of semi-naturalistic animals, the best of which is the well-known reindeer at Böla. A few paintings of this age are also known, including some conventionalised human figures at Leka. Prof. Breuil has always considered that there is some connection in culture, if not in time, between

FIG. 3.—Two groups of rock engravings on the shores of Lake Onëga (N. Russia). Probably of Bronze age.

alised in the same way as some found carved on certain menhirs, etc.; and in another rock shelter there is a painting of a man leading an animal, which indicates that domestication of animals had been learnt.

The object for which they were made would seem to be rather different from that of the Palæolithic groups. It may be noted, first, that the animals are no longer naturalistic, and, secondly, that the human form is the commonest object figured. At the same time, these rock paintings were not made for decorative purposes, for in many cases they are painted in situations difficult of access and impossible as homes.

Two examples of this may be given. In the western region there is a small cave called Las Figuras. This takes the form of a short tunnel about 10 yards long which opens some 15 ft. up on the side of a precipice. From the entrance the tunnel slopes up so steeply that it is with difficulty one can avoid slipping back over the edge of the entrance. The walls and roof of the tunnel are covered with paintings, and there are no signs left in the cave walls that any wooden constructions had ever existed, such as would have been necessary if man had ever inhabited the tunnel. The position of Las Figuras, opening as it does on the

FIG. 4.—Onëga (site B). A swan with wing feathers indicated.

the folk who made these carvings and the Maglemose civilisation of the Baltic areas. This group is certainly earlier than the next Bronze-age group, for at Bardal, near Trondhjem, the latter is found superposed upon it. On the other hand, it has been thought that the

rocks at Bardal were under the sea before *Allée Couverte* times. There may have been a cultural survival from the Maglemose civilisation, even if they are Late Neolithic in age. Is it possible that the new and interesting find of an engraved animal on a piece of crust at Grime's Graves is to be correlated with this group?

Group 5. Bronze-age rock carvings of South Scandinavia, with an outlier in North Russia. This group, which is especially concentrated in Bohuslän (north of Göteborg), is too well known to be discussed here further. It is dated from a consideration of the form of daggers figured, as well as from the carved ornamentation. Runes

are never found in association with these rock carvings.

The North Russian outlier is of some interest, and will be partly described this year. The carvings are found here on extremely hard, glacier-worn surfaces of rock, forming the eastern shore of Lake Onëga, south of Pudosh, and north of the Black River. There are ships, swans, a devil 10 ft. long, animals, a phallic scene, fish, signs, etc. (Figs. 3 and 4).

Group 6. Maritime Alps. This group is also too well known to require further discussion. The occurrence of a ploughing scene, very similar to one found in the Bronze-age group of South Scandinavia, may be noted.

Dark Nebulæ.

By DR. A. C. D. CROMMELIN.

SEVERAL years ago photographs taken by Profs. E. E. Barnard and Max Wolf rendered the hypothesis highly probable that many of the dark lanes and spaces met with in the Galaxy and in regions of diffused nebulosity were due to the intervention of occulting matter rather than to actual diversity of star distribution. One of the most notable examples occurs in a long strip of nebulosity that runs southward from

here reproduced, and is quite startling from the hard, clear-cut outlines of the marking, which is blacker than the neighbouring sky background. It would seem that this sharp outline must indicate a stratum of dust rather than one of gas; it can be traced for some distance outside the long nebula, and is probably connected with an isolated bright nebula some 15 minutes of arc distant to the north-east. It will be remembered that a great part of Orion is covered with faint nebulosity, first revealed as a large spiral by Prof. Barnard's photo-

FIG. 1.—Nebulosity south of ζ Orionis. From a photograph taken by Mr. Duncan with the 100-in. telescope of the Mount Wilson Observatory.

ζ Orionis. Dr. Isaac Roberts noted that there was "an embayment, free from nebulosity, dividing it into halves." Prof. Barnard afterwards remarked that this space appeared to be "a dark body, projected against, and breaking the continuity of, the brighter nebulosity." More recently still the object has been photographed at the Lick and Mount Wilson observatories. The Mount Wilson photograph, taken with the 100-in. Hooker telescope, is

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FIG. 2.—Enlargement of dark nebulosity in Fig. 1.

graphs with a lantern lens. There is a striking falling off of star-density to the east of the long ζ Orionis nebula as compared with that to the west, which presumably indicates a general absorption of light.

The Proceedings of the Amsterdam Academy of Science, vol. xxiii., No. 5, contains two papers by Dr. A. Pannekoek on a region of dark nebulosity in Taurus. Dr. Pannekoek refers to a paper by Sir F. W. Dyson and P. J. Melotte (M.N.R.A.S., vol. lxxx., p. 3). He uses their figures of star-density in these regions to make an estimate of