NATURE

SATURDAY, NOVEMBER 3, 1934

No. 3392 Vol. 134

CONTENTS

Editorial and Publishing Offices :
MACMILLAN & CO., LTD.
ST. MARTIN'S STREET, LONDON, W.C.2
Telephone Number : WHITEHALL 8831
Telegraphic Address : PHUSIS, LESQUARE, LONDON

The Ordnance Survey and National Needs

THE ultimate value of a map or plan is measured by the accuracy with which it records the features of the area covered. It follows, therefore, that when development of an area is rapid, frequent revision of large-scale plans is necessary. For some time past, it has been a source of complaint that the large-scale plans of Great Britain are obsolete, and in July last the International Congress of Surveyors passed a resolution requesting the Chartered Surveyors' Institution to investigate the questions raised by this condition of many Ordnance maps of the British Isles and to take appropriate action. At a meeting of the council of the Institution held on October 8, it was decided that the Institution should proceed with a full inquiry into the present position, with the view of asking the Ministry of Agriculture and Fisheries, to which the Ordnance Survey is responsible, to set up a departmental committee to consider the subject.

The most important of the large-scale plans prepared by the Ordnance Survey are the plans on the scale of 1 : 2,500, that is, about 25 inches to the mile, and the 6-inch plans. There are larger town-scales, but their case is a special one and it would only confuse the issue to discuss it now. We propose, therefore, to deal only with what used to be a great national asset, the plans of Great Britain on the scales of 25 inches and 6 inches to the mile. There was no country in the world which, before the War, had such a remarkable series of large-scale maps on sale to the public. The 25-inch plans covered the whole surface of the country except waste and mountainous areas, and the 6-inch plans covered the whole surface, without exception.

The numbers involved were large ; the area of Great Britain being about 88,000 square miles, and each 25-inch plan covering a square mile and a half, the number of these plans is of the order of 60,000—actually somewhat more. In the same way the number of 6-inch quarter-sheets is of the order of 15,000, since each quarter-sheet covers an area of six square miles. It has been calculated that the human labour put into the surveying of Great Britain on these scales is considerably greater than would be required to map the whole of Canada or Australia on the scale of 1 inch to the mile.

The 6-inch survey of the six northern counties

of England and of part of Scotland was authorised in 1840, but it was not until 1856, after much discussion in and out of Parliament, that the 25-inch scale, with reduction to 6-inch (also to be published), was approved by Parliament. By 1891 the whole of the 25-inch plans of Great Britain, except those of Yorkshire and Lancashire and a few counties of Scotland, were completed by the Survey, and the first revision of the plans was begun.

It was now very wisely laid down that there should be periodical revisions of the large-scale plans, and that these revisions should take place every twenty years; the intention being that, in the future, no plan should be on sale to the public which was more than twenty years old. The revision proceeded systematically; a second revision was begun in 1904, and this continued until the outbreak of the War. So far, the public had no reason to be dissatisfied with the out-turn of the Ordnance Survey. The large-scale plans were kept reasonably up to date, and for certain public purposes, such as land registry and land valuation, special revisions were undertaken.

The War naturally stopped the even course of the revision. The civilians of military age on the Survey joined the Forces, the Royal Engineers were sent to units in France and elsewhere, and the main activities of the Survey were directed to co-operating with the survey battalions on the Western Front and to producing the very large numbers of maps which were used by the troops on the various fronts. Altogether more than thirty-two millions of war maps were printed by the Ordnance Survey during the four years of war.

Arrears of revision naturally accumulated during the War; but with a small increase of staff and a little re-arrangement of duties, arrears would have been overtaken, and the country would have had the plans necessary for its post-War development. But what actually happened was very different.

As the result of the report of the Select Committee on National Expenditure of 1918, a system was approved by which those counties having a population of less than 100 per square mile should be revised only once in forty years, instead of twenty years. Only one county in England was affected, namely, Westmorland, and in Scotland and Wales only the mountainous counties and the islands. This measure would not materially have detracted from the value of the national maps to the State or to the public, and, looking back upon the past, one cannot but feel that it was unfortunate that this decision was not allowed to stand.

Four years later, however, there came the report of the Committee on National Expenditure of 1922, better known as the Geddes Committee. That Committee recommended a further slowing down of the revision, so that revision would be carried out only in boroughs, urban districts and those areas which had undergone considerable change since the last revision. This additional restriction resulted in a diminution of the staff of the Ordnance Survey by 143 men; it effected a saving of about £30,000 a year; and it has been the principal cause of the troubles that were to come.

During the twelve years which have passed since the report of the Geddes Committee was issued, many changes have taken place in the surface of Great Britain. Some of these changes could not have been anticipated by that Committee, or, indeed, by anyone else. We have witnessed a vast extension of that unpleasant feature, 'ribbon development'; we have seen radical alterations in our road system; we have seen an unfortunate increase in our miserable 'conurbations'; and, to quote from an admirable publication recently issued by the Ordnance Survey*, "Judging from our recent plans there has been more change in Great Britain in the period 1922–1934 than in the whole of that period which elapsed between the start of the first revision (1891) and 1922". "When we are able to resume a more active revision we shall be faced with causes such as the following. Scunthorpe, in Lincolnshire, was last revised when a population of 6,750 covered 1,031 acres. It has now a population of 33,761, and covers an area of 7,895 acres". And so the story continues.

Moreover, it is not as if the type of revision remained the same as it was in pre-War days. Partly owing to the longer interval, and partly owing to the changes above indicated, revision of the national plans is a far more laborious matter than it used to be; it takes longer, and, of course, costs more. It appears, from the publication alluded to, that whereas, with approximately the same staff, about 2,050 plans were revised in 1923, it was only found possible to revise about 500 in 1933. Or the matter may be put like this: in 1923 a 25-inch plan took about 12 man-days to

* Ordnance Survey. Professional Papers, New Series, No. 16: The National Plans (The Ten-foot, Five-foot, Twenty-five-inch and Six-inch Scales). By Brigadier H. St. J. L. Winterbotham. Pp. 112+27 plates. (London: H.M. Stationery Office, 1934.) 4*s*. 6*d*. net.

revise, whereas in 1933 it took about 77 man-days. We shall probably be within the mark if we say that a plan costs something like four times as much as it did ten years ago.

It is certain that under the present Director-General and under his predecessor, every possible step was taken to expedite the work of revision; but the task was impossible with the exiguous staff allowed. We are, indeed, being deprived of a great and valuable heritage, the magnificent series of large-scale plans of our country, and if matters are allowed to continue in their present course, the Ordnance Survey plans will lose most of their value to the public. We are not making the best of the large capital expenditure that former generations have contributed to this eminently practical, national institution, and we are not providing in a reasonable manner for the needs of our successors.

The national plans enter intimately into all our social and official activities. They are almost invariably used for the conveyance of property, for land registration, for valuation, for a hundred different engineering purposes, drainage, water and electricity supply, the construction of roads and railways, in the daily work of local government, in town-planning, for the compliance with many recent acts of Parliament, and for innumerable private purposes. At the present time, these plans are so sadly out of date that local authorities and private persons have, perforce, to make maps of their own, maps of much less reliability. The secretary of the Chartered Surveyors' Institution has rightly said that we are not making proper use of the accumulated and co-ordinated knowledge of the Ordnance Survey, that expenditure is often transferred "from taxes to rates, maps less technically excellent are likely to be produced, while even these cannot be reproduced in quantity" and, "What our institution wants to see is a return to centralised map-making by the highly competent Ordnance Survey".

It is not too late to profit by this advice, but the situation is becoming serious. If the Government will examine the question, and will take evidence as to the harm which is being done by the failure to bring the plans reasonably up to date, if it will give serious attention to the difficulties which are being caused by allowing the large-scale surveys of Great Britain to fall into such disrepair, then we feel sure that the small additional annual sum required to bring them into a satisfactory state will not be refused.

Rock Engravings in Central South Africa

The Rock-Engravings of Griqualand West ana Bechuanaland, South Africa. By M. Wilman. Pp. xii+78+70 plates. (Cambridge: Deighton Bell and Co., Ltd.; Kimberley: Alexander McGregor Memorial Museum, 1933.) 25*s*. net.

THIS substantial volume by Miss Wilman, keeper of the fine Museum at Kimberley, is the result of a quarter of a century's work, made possible by the financial assistance of the Royal Society of South Africa, and published by the Carnegie Trust through their great research branch in South Africa. The volume is far from being a complete survey of the rock engravings of South Africa, but rather the fruit of excursions round Kinderham, made chiefly during week-ends, with the addition of numerous documents by kindly collaborators.

Miss Wilman starts with a historical list of previous publications on the subject. A tale brought back by Moffat from Bechuanaland: animals and men issued from a cave where their footprints can still be seen (1842); A. Dolman (Bechuanaland, 1849); T. J. Andersson ("Traces of Men and Animals near Bloemhof and Taungs", 1866); Hubner ("Animals and Trees"); E. J. Dunn and G. W. Stow also wrote on the subject. Emile Holub, a Czech and doctor at Kimberley, made a big collection of engravings, now assembled in the Museums of Prague and Vienna and recently published by Zelisko—Miss Wilman is apparently unaware that a large selection of these was reproduced in 1905 by E. Cartailhac and H. Breuil in "La Caverne d'Altamira". Christol, Péringuey, Johnson and Rudolf Poch all contributed to the subject; it was they who suggested the importance of the patina in determining the relative chronology of engravings, and also noted that, from A.D. 1000 onwards, the Hottentots had introduced a dog and a sheep of Syriac origin into South Africa. The author also alludes to the more recent researches of Mlle Weyersberg, Lebzelter and Dart.

In Chap. ii, the distribution of the open air engravings is described, and their relation to the paintings.

Peringuey, Maak and Halls wrote of painted engravings; sometimes these are paintings scored by a sorcerer, but Johnson described one engraving masked by a painting, and Miss Mannsfeld mentions another. A map shows the geographical extension of the engravings.

Chap. iii is devoted to the physical and prehistoric setting of Griqualand West and Bechuanaland. The wide schistous tableland of the Karoo, 4,000 ft. above O.D., is covered with sand and limestone tufa. Masses of boulders of diabase and

dolerite, sometimes scored and polished by the Carboniferous glaciers, form the kopjes at 4,200 ft. O.D. Here there are no rock shelters, but these exist in the dolomites and banded sandstones of the western region of the Kap plateau. As for the Kalahari, the sand covers nearly all of it. In that region, the winter is dry, and water must be dug for; but, in summer, the soil is saturated with it. The temperature varies from $-7 \cdot 5°$ C. to $+40°$ C.

The Stone Age is well represented, from the old handaxes of Stellenbosch to the small tools of Smithfield. The latter site has also a few microlithic implements, pestles, mortars, perforated stones, either small (beads and pendants), or belonging to digging sticks. Ostrich eggs provided water bottles and beads; there are leather water bottles and some bone or soapstone pipes. In the graves of the same age, there is unbaked pottery, plain cups ornamented with spots and elementary designs. As for the perforated decorated stones of Heilbron and the cylindro-conical objects from the same district, the author considers that neither they nor the stone rings are attributable to Bushmen. On the other hand, she considers a little sculptured human head in kaolinite, found at Kenilworth (Kimberley), as that of a Bushman: this, with some engravings on ostrich eggs, are the only small artistic objects found underground. Until 1875, the Bushmen children amused themselves by cleverly modelling animals in clay.

The stone circles, often very near the open air engravings, are the sites of contemporary huts, but, in the districts with high rocks, stairways leading upwards are cut in the rock, at places suitable for refuge or for the collection of wild honey.

The author then describes the engraved rocks of Griqualand West and Bechuanaland. So far, many are known in the Vryburg region and the upper and middle Vaal valley; they are more rare on the lower reaches of the Vaal, Riet and Orange Rivers. Miss Wilman divides them into four classes:

(I). The classic style of Péringuey: animals, men, plants, star-shaped and geometrical designs.

(II). Imitations of these, or re-engravings of them at a later date, very varied.

(III). Footprints of men and animals, sometimes associated with animals and snakes.

(IV). Recent scribblings.

This enumeration is followed by a digression on the amygdaloid diabases, bluish-black in colour with a quartz and chalcedony heart; with weathering, this rock becomes dark reddish purple. It is found either on river banks or high kopjes, from which a distant view is obtained. It is there that the engravings are found, and not in rock shelters or on isolated blocks; they are either scattered or concentrated, placed irregularly and sometimes in places which compelled the artist to take very trying positions.

Group I. In this class the line is obtained by pecking clusters of spots often arranged in series or loops. The line is rough and the same shade as the rock background. There are some lines from one quarter to three quarters of an inch wide, sketches of wild animals with very few details—their species and type are often doubtful; they are in profile, though not complete silhouette, for the four legs are given, even when they are joined two and two. In other engravings (really belonging to a second group) the pecked spots blend, thus becoming a continuous line, and sometimes the pecking covers the whole or part of the figure, giving details of the curves, coat, etc. The eye is often omitted (80 per cent are without eyes), and so is the ear, if it is not seen in silhouette. They are nearly always in profile, but some are foreshortened; their attitudes are living, and occasionally there are groups of animals, such as a lion and lioness, buffalo and wild dogs, etc.

Incised lines show the coat, the surface sometimes being polished afterwards with sand. There is also a mixture of pecking and grooving. Human figures are the most rare; some are armed with bows and arrows, but many are employed in peaceful, social occupations. It is seldom that their eyes are engraved. There are imaginary beings as well; semi-anthropomorphic or legendary animals; indeterminate plants (?), star signs, vague though careful drawings, and some compositions which might be meant for landscapes (?).

Group II (really a third group). In these, the outline was first drawn with a graver; then the surface was covered more or less completely with either coarse or extremely fine pecking. Some are very old and weathered, others very recent and light in colour. The naked human figures with exaggerated sex seem to be Bushmen; not many are steatopygous—only two men and three women amongst twenty-eight figures. There are very complicated scenes. Plants are rare; the author thinks the star-shaped patterns are flowers. There are fifty-two kinds of animals, including some reptiles, their size varying from an inch or two to 43 inches (elephant). A python seven metres long stretches across two neighbouring boulders. Animals which abound nowadays, such as hippopotamus, hartebeest and springbok are seldom given, other kinds of existing antelopes are absent. The most numerous are types which have left the district, or ceased to exist, such as the quagga. As small mammals, there are only the genette and the meerkat (*Cynictis*). Birds are rare, except the ostrich. There are none of the insects noted by

Holub and Zelisko, no mastodons, or big Equidæ, or pigs such as those the bones of which lie in the old gravels of the Vaal, no *Bubalus Baïni*, or the big hippopotamus of Windsorton. There are no domestic animals; it is doubtful if there are dogs, and the Cape sheep, copied by Stow, is much later in style.

Certain engravings have been re-interpreted a second time, either at the same date or very much later (in the case of a rhinoceros, remade as an elephant), or they have been revived; but the majority have remained untouched.

Another group are imitations of the classic designs or inspired by them. These are sometimes excellent, but mostly purely geometrical. They are often on old surfaces scored by carboniferous glaciers; such as the symbols associated with various animals at Katlani and Driekops Eiland, the patina on which is the same as that of the background (and therefore very old.—H.B.). There are very numerous and excellently made geometric designs (I do not see why the author considers that these were suggested by or imitations of the engravings; it is not proved by her description, and so this Group II may be perhaps as old or older than Group I; as its geographical localisation is different, they cannot be due to suggestion or imitation; so it had better be considered as the work of a different ethnical group).

Group III. Footprints of men and animals. These are direction signs pointing towards the places where there is water, or, according to another tradition, 'creation-sites', the footprints being those of the creatures, men and animals, who emerged for the first time from the mud near a water-hole. The author suggests that there is perhaps something of a rain-making rite here. She adds that the pictures of snakes were to mark the places where there was wild honey.

Group IV. Scribblings. These have no interest; they were made recently by the mixed races and whites (alas !).

The author, in the following chapter, studies the chronological order of the figures; she does not trust much to the patina and only studies the few cases of direct super-position, citing the following instances:

1. Disconnected spotted lines of Group I are immediately below the line drawings of Group II and the filled-in ones of Group III.

2. A single line engraving is directly underneath a filled-in one of Group II.

3. A filled-in engraving, Group II, is below one with no contour line, Group III.

4. A partly filled-in engraving of Group II is immediately below another completely filled-in, Group II–III.

5. Many engravings in Group II emerge from beneath engravings of Group III. The "imitations", more or less contemporary with Group III, must have continued until recent times; as for the footprints, they are partly very old, in some cases not so old, but never recent.

In the basin of the Riet River, the incised line engravings are older than all the "pecked" ones (Afvallingskop).

What is the age of these engravings? According to Stow (1880), the most recent were only fifty years old, but the oldest (the symbols) had been there for several centuries. Holub said the most recent were a hundred years old, according to some Bushmen who were grandsons of the engravers, and the oldest more than six hundred years old. Peringuey, noting the total absence at Kinderham of oxen and sheep, considers them previous to the arrival of the Hottentots; less happily, he dated them as contemporary with the Acheulean double-faced tools found at the same spot. An elephant, reproduced by Burkitt, was drawn before the days that Hottentots added on the older figure those of iron-tipped javelins. Lowe considers the engravings of Lower Smithfield and some others, as well as certain paintings, to be of Middle Smithfield date. Lang and I consider part of them much older. At Afvallingskop, which I have visited, there is no Smithfield industry, but much of various dates in the Old Middle Stone Age. Lastly, at Stowland, the industries are very abundant and almost all of Middle Stone Age date; though it is true that some fairly good figures had been added there only a few days before our passage (1929).

After some remarks about the patina, the author accepts as date "many centuries" for the old ones, without further precision.

How were the engravings made? Miss Wilman thinks with a diamond: I pointed out that, at Stowland, flakes of quartz and chalcedony had been used. Van Riet Lowe experimented with these and proved their efficacity.

Who made the engravings? Not the painters. In Bechuanaland and South Rhodesia, engravings and paintings are near each other, but very different. The author praises the cleverness of the engravings and under-estimates that of the paintings, attributing wrongly (according to my ideas) the 'shading' to disintegration of the rock. The engravings are mostly geometric designs, flowers (?), trees, fewer humans rarely steatopygous, and yet fewer mythical groups and scenes. As a whole, the engravings seem older than the less ancient paintings, as they lack the battle or cattle robbing scenes of these latter.

The geographical distribution differs; the engravings tend to be in Central South Africa, touching the region where there are paintings in Damaraland, Southern and Northern Rhodesia and

Bechuanaland, where there are few engravings but fine paintings.

The footprints of men and animals have a wider distribution, which, I think, tends to separate them ethnographically from the other engravings. In the actual Bushman country, there are neither engravings nor paintings; there are none in Zululand (Stow and McGregor), or in southern Bechuanaland. Large tracts of country have therefore neither one nor the other.

The author almost follows (except for Damaraland) the geographical divisions given by Stow. She thought the engravers came from the North via the central region, establishing themselves in the upper valley of the Harts and Vaal Rivers, pushing forward into Griqualand as far as Withbergen, and going south as far as Beaufort West and Newbergen.

The painters, however, must have followed the west coast and the midlands of Cape Colony, going upwards as far as the south of the Vaal, where they met the engravers, resulting in a certain combined technique in the Snoewberg: some painters went as far as Griqualand. The habits of the two groups differ; the painters were cave dwellers; the engravers lived in round huts on rocky hills.

What Stow writes about them, he learnt from Bushmen, and the Basutos tell the same story. He exaggerates the density of population in the Pniel and Half Way House (Kimberley) regions, and Miss Wilman corrects this, following Péringuey. She holds (and with reason) that there were fewer engravers at a time, and that the work occupied years and even generations. There must have been settled habitations near permanent waterholes, and at such sites there are many engravings; elsewhere they are only sporadic.

Were the engravers ||N *Bushmen?* Were the primitive engravers of the same race as the last of the engravers mentioned by Stow? The author thinks so, for the different styles of engraving blend one in the other (in the geometrical and footprint series, this can be disputed). She sees here the work of a single tribe, whose descendants spread over Griqualand and Bechuanaland.

According to Miss Bleek, the ||N Bushmen who lived on the Orange River had a different language from that of the Kam Bushmen of the Cape; they wore stone bracelets to give weight to the arm when throwing a javelin.

Should these engravings be considered pre-Bushmen? Without going as far back as the Acheulean industries of Kinderham, there is a Smithfield industry site there, and Van Riet Lowe recognised the association of Old and Middle Smithfield implements with engravings; Upper Smithfield and microlithic Wilton industries are found with the paintings. I have said, and think, that, for the date of some of the engravings, we must go back as far as the Middle Stone Age.

According to Broom, the human type of the Middle Stone Age is the Australoid Korana (though the Springbok man seems to me to contradict this); he attributes to them not only all the engravings, but also the pierced stone rings of the digging sticks, and he thinks, though I do not think this can be upheld, that the engravings have been made with metal. Miss Wilman contents herself with rejecting this attribution to the Koranas, they being too stupid and indolent.

Were not footprints frequently drawn by Australians, as well as a good many symbols and even some fairly well-made figures? Can one argue from the modern Koranas what their ancestors would be? Perhaps they did their share of the engravings and the Bushmen did the best ones. Civilisation, art and race are not synonymous; no doubt, this will be for long an open question.

What did the engravings mean? At Blow Bank, Stow noticed that the old geometrical engravings were not superposed, as were the more recent. He thought that, at the beginning, these drawings were sacred and respected, and remained so for a long time. Then, after a long interval, late copies were frequently made. Certain scenes seemed to him orgies; others hunting scenes, intimate scenes, masquerades and legendary subjects. A hippopotamus at Gams is drawn across dry ground with a rope by Bushmen; no doubt a rain-making scene?

Why are certain boulders covered with drawings (Afvallingskop), whilst others nearby, just as suitable, have nothing on them?

So far, the engravings have been fairly well studied on the Vaal, in Griqualand West at Pniel, Klipfontain, on the upper stretches of the Riet River, at Vereiniging, etc.; but no complete study has ever been made, no corpus published nor even classified, in spite of Miss Wilman's effort.

The technique and the subjects vary from one site to another. At Kinderham humans are associated with animals; elsewhere, the animals are alone. In other places, stars, trees and geometrical designs are side by side with animals and men. The animals vary at the different sites; there are no jackals amongst the engravings on the Vaal. In certain spots, geometrical designs predominate.

How many unsolved problems there are! Miss Wilman has at least made an objective contribution, profusely illustrated, to this entrancing subject; she adds some valuable observations, and we must congratulate her on not having delayed publishing what she knows and thinks, and be ready to discuss the one, and gratefully make use of the other.

H. BREUIL.