

Channel coasts; and in the lower Severn area it meets that of the crucial correlation with the upper Thames. Near Gloucester, the Barnwood gravels are of further importance, for they link up with the Main Terrace of the Severn, and so with the "Cornovian" (or Irish Sea) Glaciation, which laid the "Older Drift" of Wales. That glaciation was followed by the "Cymrian," responsible for the "Newer Drift" of South Wales and the upper Severn, which is habitually correlated with the Hessle and Hunstanton boulder-clays (as Würm II). If this is the glaciation that sealed the Upper Palaeolithic floor of the Cae Gwynn Cave in North Wales and produced a corresponding cold-climate layer in the Pin Hole Cave at Creswell Crags (Derbyshire), an important synchronism is gained; but the correlation thus entailed for the "Cornovian" (i.e. Würm I and not Riss) is by no means free from difficulty, and the problem as a whole is not yet resolved.

4. *Midlands and North*

The "Cornovian" Glaciation has been identified also in the upper Trent Basin, as well as elsewhere in the Midlands, where the glaciation before it (and following that of the still earlier "Northern Drift") is that of the "Eastern Drift." This can be equated with the "Great Chalky Boulder-clay" of East Anglia, subject to the reservations regarding the East Anglian sequence outlined above; the Trent Basin drift-sequence as a whole has probably still evidence to give for correlating the drifts of eastern England with those of the West.

In the North, much turns on the correlation of the York Moraine. It can be taken as the outer edge of the "Newer Drift" or Hessle Boulder-clay Glaciation (= Würm II); but here again there is a case for making it directly follow the "Last" Interglacial (i.e. be Würm I), and the problem is really another aspect of that sketched above in connexion with the Brunton and Nar-March deposits of East Anglia and the "Upper Chalky Drift" (p. 15).

The successive retreats of the Würm Glaciation ice-sheet may be interpreted as a sequence of three, answering to the Daniglacial, Gotiglacial, and Finiglacial of the Baltic region. The first of these would then be followed by the "Scottish Re-advance" (= Würm III), the second by the Lammermuir-Stranraer-Antrim Coast Re-advance of the Scottish Southern Uplands and the so-called Valley Glaciation of the Highlands, the third by the final melting, which in archaeological time is within the Mesolithic. But the interpretation of their various features still provides considerable problems for the glacial geology of Scotland.

B. ARCHAEOLOGICAL ASPECTS

Palaeolithic man subsisted by food-gathering or hunting, and his activity is recognized by archaeology primarily from his artifacts or tools, which in Britain are normally of flint. They may be grouped in "industries," and these consigned in turn to "cultures."

1. *The Abbevillian Culture*

The oldest extant culture typified by "hand-axe" tools, formerly known as "Chellean," is now more accurately defined as Abbevillian. The hand-axes are thick bifacial tools with deep-biting flake-scars, attributed to work with a hard hammerstone or on a fixed stone anvil; in the Somme valley, together with crude flake-tools, they occur in gravels assigned to the Interglacial preceding the Mindel Glaciation. In Britain, while they are relatively common as "derived" pieces in deposits certainly later than that Glaciation (e.g. gravels of the Boyn Hill and Middle Terraces of the Thames), underived specimens are rare. One is recorded from Whitlingham (Norfolk), in the Stone Bed at the base of the Norwich Crag; this, perhaps with some other tools from that bed—e.g. a scraper (on flake) from Thorpe, can hardly be "eolithic," but the horizon requires a date at latest before the second of the Crag cold phases. If those are rightly equated with the Günz Glaciation, the Abbevillian will go very far back; and for the flake-tools comparison might be made with the assemblage claimed from the Newer Red Crag at Foxhall (p. 21). The Cromer Forest Bed of the ensuing Interglacial may also have produced an Abbevillian hand-axe, found at Sidestrand (Norfolk) apparently "derived" in the Cromer Till of the "North Sea" or Mindel Glaciation following. Of the so-called "Cromerian" specimens from the North Norfolk foreshore, most or all appear very doubtful (below, p. 21); moreover, the majority of any that seem *in situ* come from the underlying Stone Bed, so that the Interglacial represented by the Forest Bed has in Britain very little yet to show, either of the Abbevillian or any other culture.

2. *The Acheulian Culture*

The Acheulian hand-axe culture represents a development from the Abbevillian, in which the distinguishing feature is the shallowness of the flake-scars, attributed to flaking with a bone, antler, or hard wood bar, or possibly a soft hammerstone. On the Somme the initial or Lower Acheulian is stated to occur before as well as after the Mindel Glaciation. This may be true of Britain too. "Abbevillio-Acheulian" implements are said to occur in the Winter Hill (or 150-ft.) terrace of the Thames between Caversham and Henley. The Lower Acheulian, however, is most typically represented, e.g., in the Gravel Hill Channel in Terrace A of the Wey at Farnham (Surrey),

judged to be contemporary—assuming the “Thames Valley Glaciation” to be Mindel, not Riss (p. 16)—with the Boyn Hill lower gravel at Swanscombe. The Middle Acheulian, much more widespread, appears later in the same Interglacial : e.g. (to quote only rich and well-known localities) in the middle gravels at Swanscombe, in the Furze Platt and Lent Rise gravels of the Thames near Maidenhead, and in those of the Ouse at Biddenham (Beds).

In the Lower and early-Middle Acheulian, the predominating biface tools are pear-shaped or massively almond-shaped hand-axes, made on cores, as in the 30-metre (“Mindel-Riss Interglacial”) terrace of the Somme. In deposits laid in in the maturer Boyn Hill stage these types become thinner, more often made bifacially worked on flakes, and more finely manufactured, showing not only secondary but some tertiary flaking or “working down” at the margins.

In deposits apparently late within the same stage, two developments are especially notable. One is the appearance of sharp-pointed hand-axes of long-triangular or wide-butted pear shape, with some tertiary flaking. But these closely resemble the “Micoquian” industries of the Upper Acheulian in France, which belong unquestionably to the “Last” (Riss-Würm I) Interglacial. If then the Boyn Hill stage falls wholly within the Interglacial before that (Mindel-Riss), these hand-axes will be prototypes of the recognized Micoquian series; yet they could be coeval with it, if the river-gravels which yield them could have been deposited—at the level of the Boyn Hill Terrace (e.g. at Upper Dovercourt, Essex)—within the “Last” Interglacial. The other development is that of the neat small bifaces, cordate or twisted ovate in shape, found in some of the latest deposits of the Boyn Hill group, e.g. the Ingress Vale shell-bed at Swanscombe. Here the cordates have been compared with the small “Combe Capelle” type of hand-axe which in France belongs to the end of the “Last” Interglacial, being associated with the earlier phases of the “typical Mousterian” culture (below, p. 24). If they were coeval with this, it would be the Würm (I) Glaciation that ended the Boyn Hill stage, and not the preceding Riss. That is, just as geologically (p. 16) there is a case for making the Boyn Hill stage begin with the Riss Glaciation and not the Mindel, so, archaeologically anyhow, it could be argued to end with the Würm I and not the Riss. But many would reject both arguments, and continue, as outlined above, to assign it to the Mindel-Riss Interglacial.

And it is on any showing clear that Britain can show fully developed Upper Acheulian material, which can often be assigned to the “Last” Interglacial with some confidence. It occurs, e.g., in the brick-earths of Elveden (between the last two Breckland boulder-clays, p. 15), where it cannot be earlier. Comparable Upper Acheulian material from the brick-earths at Round Green and Gaddesden Row in the Chilterns is referable to the “Last” Interglacial; or, as some think, to a mild interval or “interstadial” within the glacial period following the interglacial that yields Middle Acheulian (see above).

And these industries are maturer in technique than the late Boyn Hill "Micoquian prototypes" above noticed, so that their separation from those by a full glaciation (i.e. Riss) is not in itself unlikely. Most of their hand-axes are made on flakes, the bifacial working of which often gives a plano-convex cross-section, e.g. in many long-triangular specimens; biconvex ones may preponderate locally, but are thin and leaf-shaped. The tertiary flaking is as a rule skilful. There are also ovates (usually thin and often twisted) and cordates, like those of late Boyn Hill age above noticed, but now freely acceptable as coeval with the Combe Capelle type of France; and all the more so for their association sometimes with appropriate Levallois or "early Mousterian" flake-tools (below, pp. 22, 24). Lastly, the same may be said of the Final Acheulian sometimes claimed as Würm I-II: in age, if really later than the East Anglian "Upper Chalky Drift" (p. 15).

The Acheulian throughout has its own flake-products, whether waste flakes, with diffused "soft" bulbs, or simple flake-tools, often with salient or "hard" bulbs (both with narrow platforms). But, side by side with it, there run flake-industries which are recognized as culturally distinct. These must now be considered.

3. *The Clactonian Culture*

The initial Clactonian flake-industries are the earliest yet known in Britain which can be comprehended in a definite culture. In several text-books, indeed, they are stated to have developed from the "Cromerian" of the North Norfolk foreshore (p. 19); but the flake-material on which this assertion rests has not been found *in situ* in the Cromer Forest Bed: much of it (and its typical orange patina) has been claimed to be of modern or natural origin, and the question of definable flake-industries in the underlying Stone Bed, as also in the Suffolk Red Crag, e.g. at Foxhall, still remains to be clarified (p. 14). If such Early Pleistocene flake-industries are proved, any connexion with the Clactonian will need to be built up from finds assignable to the Günz-Mindel or Cromer Forest Bed Interglacial. Certain "derived" Clactonian artifacts from the lower (Boyn Hill) gravel at Swanscombe, being abraded with wear and striated by solifluxion (thaw-movement of glacially-frozen subsoil), are presumably not later than the pre-Boyn Hill "Thames Valley glaciation," usually (pp. 16, 20) taken to be the Mindel. But that need not make them as early as the Cromer Forest Bed; and typologically they are not at all "Cromerian," but closely similar to the unworn Clactonian material amongst which they have been found, i.e. to the industry of the Swanscombe lower gravel itself.

This industry and that of the Clactonian type-site, the buried channel at Clacton-on-Sea (p. 19), belong respectively to the early and early-middle phases of the Boyn Hill stage. In neither deposit is there any sign of a hand-axe: the "typical" or Lower Clactonian is thus certainly quite distinct from