OUR NEIGHBOURS IN THE NEOLITHIC PERIOD.

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It may seem a paradox, but it is nevertheless true, that more is known of the remote Palæolithic period than of the later Stone Age that ended about 4000 years ago. This applies to the Continent as well as to Britain, but Scandinavia is exceptional, and for our present purpose the best subject of investigation. The accepted view is that the three Baltic kingdoms were uninhabited in Quaternary times, and could only be approached by man after the last, or Baltic, glaciation had come to an end.* There are certain facts inexplicable on that hypothesis, but all will agree that the Neolithic period in that area can be divided into early and late divisions; and so rich are the prehistoric remains and so advanced is this study, that the Scandinavian system can be used as a touchstone by which to test the facts and theories of our own later Stone Age. I propose, therefore, on the present occasion to deal in some detail with the latest results of Scandinavian research, and then to proceed in order with the districts that face us across the North Sea and the Channel—North-west Germany, Holland, Belgium, and Northern France. It is hoped that such a survey will enable a more rigid classification to be made of the large amount of British material referred to the Neolithic period. In this country one has to rely mainly on form, but in Scandinavia that element is combined with others, such as habitation-sites, shell-mounds, and megalithic remains that furnish proof of the succession of forms, and open up the question of relations with Britain at that early date. If the claims already made on that head be valid, then comparisons become possible, and certain stages at least of the period in question can be arranged on scientific lines.

A bibliography is here out of the question, but the principal sources are indicated in the text, and on that basis further research should be a comparatively easy matter. The material is so abundant that only an introduction can be attempted within the present limits; and a clear understanding of the technical terms—the grammar of the subject—is a fundamental necessity.

In a study where so much is uncertain, it is comforting to come across undisputed facts and clean-cut divisions. In the early days it was said of Scandinavia (as it is still said, somewhat boldly, of Ireland) that palæoliths were unknown, and human occupation began with the Neolithic period. This is not so true

*According to Prof. de Geer the ice began to disappear from the southern extremity of Sweden (Scania) about 13,000 years ago.

as it was. Not only have remains of the mammoth been found in Norway, suggesting the presence of contemporary man, but actual implements of palæolithic appearance have been found, about 100 in Sweden, several in Denmark, and 10 or 15 in Norway. § These are ascribed with some hesitation to the later stage of the Ancyclus period, when the Baltic was an inland sea, and a land-bridge existed between the Danish islands and North Germany. Further, it has long been recognised as a principle that the kitchen-middens or shell-mounds of Denmark date from the earliest stage of the Neolithic period. This was degenerating into a dogma when Sarauw published his account of the discoveries at Maglemose (Mullerup, Zealand), the result being that one, or possibly two, stages must be placed before the shell-mounds; but even that alteration does not take us back to the Palæolithic period. There is indeed an Early Stone Age in Scandinavia, but the division is within the Neolithic period. Classification in Scandinavia is in such an advanced state that two tables will be necessary to present a survey of the Neolithic period, applicable with some modifications to all three Northern Kingdoms:—

SOUTHERN SCANDINAVIAN AREA.

<i>Land Movements.</i>	<i>Culture.</i>	<i>Fauna.</i>	<i>Flora.</i>
After Baltic glaciation the land sinks.	None.	Yoldia (Portlandia) arctica	Dryas octopetala (mountain avens).
Land rises, and Baltic becomes a fresh-water lake.	Axes of reindeer antler Maglemose (raft-dwellings)	Ancyclus fluvialis and elk	Birch.
			Pine.
Land sinks considerably, then rises again.	Kitchen-middens (shell-mounds)	Littorina littorea or Tapes decussatus; Red-deer.	Hazel.
			Oak.
Land continued to rise till early mediæval times	Passage-graves (chambered barrows) Bronze age.	Limnaea ovata.	Spruce
	Iron Age.		

The present paper is more concerned with the works of man than with natural history, but it must be here explained that the stages are for the most part named after the most characteristic and abundant shell in the Baltic. *Littorina* was predominant at the time of maximum depression on the Swedish and German coasts, and *Tapes* was its equivalent for Denmark, West Sweden, and Norway.

In estimating the geological date of the principal Danish shell-mounds, it must be borne in mind that the earth-movements were alternate north and south of a line running N.W. to S.E. through Nissum (on the north-west coast of Jutland) and the north of the island of Falster. Hence the kitchen-middens which fringed

the coast on the north of the line are now raised above the shore-level, and those to the south of it are depressed, in proportion to their distance from the fulcrum. The middens in Kiel Harbour, for instance, are 30-ft. below sea level. The early shell-mounds can by this method be assigned to the maximum *Littorina* depression of the land, when the red-deer was the principal animal of the chase, and the oak was the predominant forest-tree.

DIVISIONS OF THE NEOLITHIC PERIOD.

EARLY	<div> <div>[Axes of reindeer antler]</div> <div>Maglemose, raft-dwellings on lakes</div> <div>Kitchen-middens or shell-mounds</div> </div>	Hunting and fishing.
LATE	<div> <div>1. Form of graves unknown, celts with pointed oval section.</div> <div>2. Dolmens as tombs, celts with thin butt</div> <div>3. Passage-graves (chambered barrows), celts with thick butt</div> <div>4. Stone Cists, celts with thick butt and spreading edge</div> </div>	Agriculture and cattle-raising.

The above scheme of the Scandinavian Neolithic period is due principally to Prof. Montelius, of Stockholm (1893), and forms the basis of all recent work on the subject, though certain adjustments have been necessary from time to time. Aided by geological knowledge of successive alterations in the relative levels of land and sea, archæologists have been able to elaborate the scheme, and to follow changing fashions in the leading types of implements, all tending to shew that, short of infallibility, form is the best criterion of date in Scandinavia. After the maximum *Littorina* depression there was a steady rise in the Christiania district till early mediæval times; and the transition from Early to Late Neolithic took place when 20 per cent. had been accomplished; the transition to Bronze at 80 per cent. According to Lindquist (*Prähistorische Zeitschrift*, IV. (1912), 405), in Nerike, between the lakes of Wener and Hielmar, the sea was 200-ft. higher in the Stone Age, 133-ft. in the Dolmen period, and 100—83-ft. at the time of the passage-graves; cists are found almost at the present sea-level.

Having now traced the outline, we may proceed to fill in some of the details, which consist mainly of implement-series from well-known and well-explored sites that have given their names to certain industries. While preserving the chronological order as far as possible, it will be convenient to describe briefly, under their place-names, several early groups, and notice in the later division some of the fine stone implements that now find their places in the general scheme.

There is, however, a preliminary matter of some importance, and in order that others may be spared the trouble of ascertaining equivalent terms in other languages and groping in dictionaries for words that are not there, I offer with some diffidence a table

ENGLISH.	NORWEGIAN.	SWEDISH.	DANISH.	FRENCH.	GERMAN.
Shell-mound axe	Skivespalter	Skifyxa [ismeislar, planyxa]	Skivespalter	Grand tranchet	Flintespalter Scheibenspalter
Transverse arrow-head	Flintöx, kjernökse	Tväreegade pilspets	Flækkespalter	Petit tranchet	Spalter-pfeilspitze
Pick	Butnakked öx	Rundtomslagen (kern) yxa	Flintöx	Pic	Kernbeil, Pickel
Blunt-butted celt		Trindyxa	Trindöx	Hache cylindrique en boudin	Stumpfnackiges Rundbeil, Walzen- beil
Pointed-butted celt	Spidsnakked öx	Spitsnackig yxa			Spitznackiges Beil
Thin-butted celt	Tyndnakked öx	Tunnackig yxa			Dünn-nackiges Beil
Thick-butted celt	Tyknakked öx	Tjocknackig yxa		Hache à tête épaisse	Dicknackiges Beil
Broad-edged celt	Bredeggd öx				Breitschneidiges Beil
Perforated (battle) axe	Skaftthulsöx	Skaftthalsyxa		Hache-marteau	Hammeraxt
Chisel-edged celt	Tveröx				Querbeil
Central-edged celt	Retöx				Gradbeil
Pecking, bruising	Stödning, Afknusning, Prikknugning	Bultning	Afstödning, Tilknusning	Piquage	Picken
Round scraper	Rundskrapper	Skrapa af kort span	Skiveskraber	Grattoir arrondi	Kratzer
End-scraper on blade		Skrapa af lang span	Flække-skraber	Grattoir sur lame	Klingen-kratzer
Dwelling-site	Boplads, bosted	Boplats	Boplads	Fond de cabane, Station habitée	Wohnplatz
Shell-mound, kitchen-midden		Kjökken-mödding, Skaldyng	Skaldyng, Kjökkenmödding, Affaldsdyng	Amas de coquilles	Muschel-haufe
Dolmen		Stendös	Dysse		
Chambered barrow	Ganggrav	Ganggrift	Jättestue, Gangbygning	Allée couverte, Chambre de géant, Sépulture à galerie	Ganggrab, Hünen- bett, Riesen- stube
passage-grave					
Cist-grave		Hällkista	Enkeltgrav	Coffre de pierre	Steinkiste
Single-grave		Enmans(ensam)graf			Einzelgrab

showing the various translations of the principal technical terms connected with the Neolithic period. This has had the advantage of revision at the hands of my friend Dr. Haakon Schetelig, the distinguished Curator of Bergen Museum, and one of the leaders in Norwegian archæology.

The earliest Neolithic remains in Scandinavia are a few axes of reindeer-antler (one each in Jutland, Fyen and Zealand), found in circumstances that point to their original occurrence in late-glacial clay. A similar discovery has been made in Brandenburg, but the series is quite unlike late palæolithic work in the same material, and there seems to be no connection with the Cave-period of Western Europe.

Important discoveries at Maglemose were made and described by Dr. G. F. L. Sarauw in *Aarbøger for Nordisk Oldkyndighed*, 1903, p. 148 (*En Stenaldersboplads i Maglemose ved Mullerup*); and a later version given in *Prähistorische Zeitschrift*, III. (1911), p. 52, and VI (1914), p. 1. The site is near Mullerup (south of Lake Tis, in Zealand), and now consists of firm and nearly level ground about 13-ft. above the sea, a typical section of about 9½-ft. consisting of (i) turf, (ii) peat, about 7-in. thick, (iii) mud with mollusc shells, deposited when the sea was 6½-ft. above the turf level, (iv) mud, and (v) clay and sand with pebbles. The principal finds were just above the shell deposit, at 12—16-in. from the surface. The conclusion came to was that the population lived on rafts floating on what was then a lake; and since their occupation the site had become dry ground, as the stools of Scots pine were found above the occupation level. The most striking feature of the finds is the extensive use made of bone and antler and the paucity of flint, suggesting a late Palæolithic rather than an early Neolithic date. There are geological arguments for a date previous to the shell-mounds (maximum Littorina depression), and the official view is that the raft-dwellers lived in the preceding Ancyclus period (greatest extent of land). On the other hand, the late Dr. Stjerna assigned this "epipalæolithic" culture to the first half of the Littorina period, before the great depression of the land (*Före Hällkisttiden*, pp. 2—8). Pottery was unknown, and the rich stores of local flint hardly utilised at all. Elk-antlers were cut and perforated for use as axes, either with a sloping edge or with a flint or tooth fitted into the socket; chisels of bone, fish-hooks, and harpoon heads with barbs or grooves along the sides for flint teeth; flint axes with chisel or central edge, and diminutive flints in the form of arrow-heads, with a sharp side, rather like the blade of a penknife.

Examples of this culture are rare in Denmark or on the south coast of the Baltic, and never occur in Norway or Sweden. The next stage is marked by several examples of the bone harpoon head, with grooves down the sides for the insertion of flint flakes to act as barbs. Only one was found at Maglemose, but they occur later even in Scania (southern extremity of Sweden), and belong to the culture named after Kunda (Esthonia, on the Gulf

of Finland), which in Denmark preceded the principal shell-mounds, Ertebølle being the typical site. In the epipalæolithic period (Maglemose and Kunda), man preferred to live near (or over) fresh water, whereas in shell-mound times his remains are found fringing the sea-shore.

The discoveries at Brabrand, described by Thomsen and Jessen in *Mémoires de la Société royale des Antiquaires du Nord*, 1904, p. 162, are mysterious in more than one particular, but furnish a link between Maglemose and the earlier shell-mounds of Denmark. The site is on the east side of Brabrand lake, 3 miles W.S.W. of Aarhus, on the east of Jutland, the geological sequence being as follows :—

Gravel.

Sand, deposited in shallow water.

Dark mud with shells, deposited in deep water.

Lower gravel.

Peat, freshwater deposit : *Ancylus* date, with pine.

Glacial deposit.

The sand contained oak (Tapes period) and human relics, the latter being indeed found in all the marine (shore) deposits ; and the shells in the dark mud were evidently undisturbed, being in their natural position, and originally deposited in at least 3-ft. of water, including oyster, mussel, cockle, periwinkle, and other species. The aurochs was well represented and the elk rare, the latter being very scarce in the earliest shell-mounds, but better represented at Maglemose. The upper levels contained most of the *grands tranchets* (shell-mound axes), and there were very few *petits tranchets*, or transverse arrow-heads. The deer-antler axe-heads included one with engraved lozenges ; a pottery vase was found 10.2-in. high with pointed base, and made in spirals from below, consequently very fragile ; a bone comb, originally with five teeth ; and several wooden objects, some resembling a boomerang and a bow. The site must often have been under water, but there was no sign of a pile-dwelling, and the raft theory does not seem to square with all the facts. It is difficult to explain how the relics got into the water, but further research there or elsewhere may reconcile the geological and archæological evidence.

The excavation of a shell-mound at Viste (in the parish of Randeberg, Jaederen, on the S.W. coast of Norway) in 1907 revealed several types new to the Stone Age of the country, though they lay only 12-in. below the surface, at 57-ft. above the sea, and just above the shore-line of the post-glacial land subsidence (45-ft. above the sea). Bone and antler tools were well preserved, and chief among them were elk-horn harpoons with barbs or with flint teeth set in grooves (as Brit. Mus. *Stone Age Guide*, 2nd edn., fig. 126), these last being characteristic of *Ancylus* dwelling-sites, such as Maglemose. At Viste, which is assigned to the upper Campigny of France, and is the earliest site in West Norway, such harpoons must therefore be survivals into Littorina times on the circumference of the inhabited area. The flints included

large *tranchets* (rarely found in Norway), flakes or blades (some surprisingly small), end-scrapers (round or hollow), round-scrapers, borers, and cores; also blades and splinters of crystal. Small fragments of polished greenstone support the theory that the polishing of flint came later. A few pottery fragments were found, and among the fauna the pole-cat and wild boar shew that the climate was warmer than now. Though Jaederen is now treeless, there were traces of the aspen, birch, Scots pine, oak, and alder. Jaederen might be considered part of Denmark in the Stone Age, for flint was procurable in the glacial drift which had been swept up from the cretaceous deposit now under the Skagerrack by a rush of water from the south. But the largest piece found at Viste was only 4-in. by 1½-in., so that no great development of the industry could be expected.

It is pointed out by A. W. Brøgger that the Ancyclus level in Jaederen is now below the sea-level, but Georg Sarauw takes the Viste evidence at its face value, and places the occupation long before the Campigny period, his complete scheme of the Neolithic being as follows (*Paläethnologische Konferenz in Tübingen*, 1911, p. 28; *Beiheft zum Korrespondenz-Blatt der deutschen Gesellschaft für Anthropologie, etc.*, 1912):—

c. LATE NEOLITHIC OR EPIMEGALITHIC.

Stone cists. Single graves with flint daggers. Many lake-dwellings.

b. MID NEOLITHIC OR MEGALITHIC.

Agriculture and cattle-raising. Pit-dwellings, lake-dwellings, and megalithic tombs. Polished flint and other stones. Sites include Aalborg, Horsens, Omal, camp de Chassey, Michelsberg, Grossgartach, Jordansmühl, Butmir, Aloppe, and Spiennes.

a. EARLY NEOLITHIC OR PRE-MEGALITHIC.

Dog the only domestic animal. Settlements on shell-mounds and rafts. Polished stone, but no polished flint.

Divided into the following phases:—

Tapes-Littorina Period.

6. CAMPIGNY (*France*).

Transition. Cattle perhaps domestic. Pit-dwellings. Pottery developed and ornamented. Shell-mound axe and pick still in use.

5. ARISE (*France*).

Polished stone side-scrapers. Smoothing stones. Deer-antler harpoons.

4. ERTEBÖLLE (*Jutland*).

Polished blunt-butted celts. Transverse arrow-heads. Polished pebble-axes rare. Polishing stones. Deer-antler harpoons. Thick-walled pottery common.

3. KUNDA (*Estonia*) AND VISTE (*Norway*).

Polished stone picks (fragmentary). At Kunda no pottery but bone harpoons. Smoothers. At Viste few pottery sherds, coarse and plain, bone harpoons, barbed hooks, and polishing stones.

- Ancylus Period. {
2. **MAGLEMOSE (Denmark).**
Dog present. Shell-mound axes and picks rare. Hammers. Pebble mace-heads. Small arrow-heads of pen-knife type. Horn axes and chisels. Bone axes. Smoothers. Bone daggers. Cleavers. Bone points. Bone and antler harpoons. Barbed hooks. Teeth as beads. No pottery.
 1. **MAS D'AZIL (France).**
No reindeer. Perhaps dog. Pebbles ground to an edge. Small arrow-heads of pen-knife or Tardenois type. Horn chisels. Bone smoothers. Bone points. Deer-antler harpoons. Teeth as beads. No pottery.

PALAEOLITHIC.

c. LATE PALAEOLITHIC	{ La Madeleine I—III
Solutré
Aurignac	} Reindeer
or Yoldia
period.
b. MID PALAEOLITHIC	{ Le Moustier
etc., etc.	

Fig. 99.

Shell-mound Axe of Flint. $\frac{3}{4}$.

Fig. 100.

Flint Pick of the Shell-mounds. $\frac{3}{8}$.

The so-called kitchen-middens of Scandinavia, now preferably called shell-mounds, are too well known to need a detailed description here, and can be dealt with in general terms. Since 1837 many have been recognised and explored, and in 1893—7 an organised investigation of selected sites was undertaken by a committee of experts for the National Museum at Copenhagen,

the result being a sumptuous report, entitled *Affaldsdynger fra Stenalderen i Danmark* (1900). Since then, Ertebölle (between Thisted and Aalborg in Jutland) has been taken as the typical shell-mound of the early series, to which the majority belong; and the present position of these long low mounds, mainly consisting of the shells of various food-fishes (oyster, cockle, mussel, periwinkle, and whelk), on what was the shore-line at the time of the maximum *Littorina* depression, is taken as proof of their great antiquity. With few exceptions they belong to the early Neolithic period, and the leading types of implements are the shell-mound axe (Fig. 99) and the pick of Campigny type (Fig. 100), both made of flint, which was to be had in plenty. The contemporary flora included the oak, birch, elm, aspen, alder, and hazel, and the dog was the only domestic animal. Though shells abounded, fish-bones were rare in the mounds, and the inhabitants indulged in the chase, but were ignorant of agriculture and cattle-raising.

Fig. 101.

Greenstone Celt, Nöstvet Type. $\frac{3}{8}$.

Nöstvet itself is at the inner end of Christiania fjord, but the name is now given to a group of stone implements found on dwelling-sites there, as well as on the coast of Bohuslän, in Sweden, and of southern Norway. These implements represent a culture that is about contemporary with the early shell-mounds of Denmark and south-west Sweden, dating from the maximum *Littorina* depression, but for the most part confined to districts where flint was scarce or unprocureable. The materials in common use were "greenstone" (a term including diabase) and sundry volcanic rocks, such as quartz, porphyry, fine-grained syenite porphyry, and other rocks that have a conchoidal fracture, and so served as a substitute for flint. It is clear from the technique that the original models were of flint, and the greenstone copies were at first merely chipped; a later stage is marked by polishing the two faces near the cutting-edge of the celt, and a larger area

was so treated in certain cases. The typical implement is long (Fig. 101), and the type-specimen generally referred to is Fig. 4 in Rygh's *Norske Oldsager*. It is evident that the unpolished specimens were used in that state, and were not roughed out for subsequent polishing. The type is distinguished from the common Neolithic celt by its chisel-edge: that is, the edge is flush with one face, not in the central plane, a peculiarity due in the first place to the schistose nature of the rock employed. The cross-sections also vary, no doubt in agreement with their dates within the period in question, the earliest being triangular: the gable is then rounded, a trapezoidal section emerging, and other varieties of less importance are found. The length is generally between 2½-in. and 6-in., and the average breadth of the cutting-edge is 2¼-in. Those with the early features already mentioned are imperfectly flaked, and range between 3½-in. and 4½-in. in length; while the later specimens, with polished edges, are between 4½-in. and 6-in. long. The typical implement of the shell-mounds (*tranchet*) is occasionally found, of flint or other stone, in association with the Nöstvet type, but there is no organic connection between them, the Norwegian type being probably derived from another shell-mound flint type, the pick, corresponding to the *pic* of Campigny.

The dwelling-sites, once occupied by a primitive population living by fishing and hunting, are mostly round Christiania fjord, but followed the coast-line of the period both east and west; and the culture seems to have reached Bohuslän, on the west coast of Sweden, before the art of polishing stone implements had been acquired, as the representative station there shews the work of a people only familiar with flint-chipping. The absence of their favourite raw material led them to exercise their skill on local rocks, and Lihult seems to be a counterpart of Nöstvet. The latter site averages 190-ft. above present sea level, the former is between 150 and 167-ft., but both were on the coast-line when the land-depression reached its maximum in the Littorina period, and the same may be said of Vespestad (Bömmelö, South Bergenhus) on the south-west coast of Norway, though it is only 6—13-ft. above the sea. The climate was unusually favourable and somewhat warmer than at present.

Lihult, in North Bohuslän, gives its name to a culture in central and south Sweden, corresponding to that of Nöstvet, in Norway; and the typical axe is of greenstone with two faces, one approximately flat and the other convex. What appears to be the earlier form is rather of the pick outline, with an oval cutting-edge, but there are many transition forms between this and the squared cutting-edge which is usually associated with the Megalithic period, and these shew at least that the Lihult site was occupied both in the early and late Neolithic period.

Vespestad may be a little later than Nöstvet, not only on account of its implements but also its position, far to the west of what was then the centre of activity. All the implements are

of greenstone, and the dominant type has a chisel-edge (flush with one face) and a curved back-line (Fig. 102). It is short and broad, with narrow sides, and more or less squared section, the surface being first chipped and then ground all over into facets. From it is descended the Westland type, which is larger and better made, with more or less squared section, but seldom faceted, the cutting-edge being produced as before by grinding from one face like a chisel (Fig. 103). The Westland type is never found on dwelling-sites, whereas the Vespestad type is seldom found away from them. The former is evidently derived from the latter, and is found in three main varieties, the features common to all being the domed face, chisel edge, taper of the faces towards the butt, and four-sided section, all the sides being more or less convex. They are usually under 4-in. long, and are mostly of fine-grained greenstone.

Fig. 102.
Greenstone Celt, Vespestad
Type. $\frac{3}{4}$.

Fig. 103.
Greenstone Celt, Westland
Type. $\frac{1}{2}$.

A dwelling-site (*bopläds*) of the Stone Age has been discovered in the centre of Neolithic activity, at Limhamn, near Malmö, on the coast of the Sound at the south-west angle of Sweden. It was described by Knut Kjellmark, in *Antiquarisk Tidskrift för Sverige*, XVII, part 3 (1905) with several illustrations of the antiquities discovered in 1891 and following years, he having personally investigated the site in 1901-2. The site was a long sand and gravel bank, called Järavallen, running parallel to the shore and about 17-ft. above sea-level. The occupation level, marked by a black band in stratified gravel, was not quite horizontal, being on the average 6-12-in. thick and $1\frac{1}{2}$ -4-ft. below the surface. There were a few polished celts of greenstone, but most of the

implements were of flint, and the Limhamn type is of rough work, four-sided and ground only at the edge; a few, polished all over, retain traces of chipping, and many of the specimens were water-rolled. The body is flatter and the edge generally broader than the Nöstvet type; and the distribution in Scania and Blekinge is explained by the abundance of flint in the southern extremity of Sweden. In addition, there were the usual shell-mound axes and picks, and a number of transverse arrow-heads, ranging in length between $\frac{1}{2}$ and $1\frac{1}{2}$ -in. No difference of type could be detected in the various layers, and all are attributed to the close of the early Neolithic period. Bone-fragments of the red-deer, roe, sheep, pig (?), dog, and seal were recognised, but bones of any sort were scarce, and no implements were found of that material. Stones forming hearths were still in position, and the potsherds corresponded to Danish shell-mound forms but were not identical. Thick coarse specimens came from the lower layers, and thin ware from the upper. A hoard of stone celts from Limhamn is figured in *Fornvännen*, 1916, p. 134, fig. 15; and a useful summary in English of Kjellmark's report is to be found in Dr. F. Arentz's *Palæolithic period of the Scandinavian Peninsula*, p. 12.

The closing stage of the early Neolithic in Scandinavia is characterized by a special type of greenstone celt, almost cylindrical, and prepared by pecking§ or bruising with a hammerstone instead of by flaking as if it were flint. Its synonyms are given in the table (p. 482), and the main features are reproduced in Fig. 104. The cross-section is oval, approaching a circle, and the cutting-edge is oval in plan, an early feature seen also in the shell-mound picks; but its most important feature is the blunt butt. No local proto-type of this has been agreed upon*, and the general opinion is that it was imported into Sweden and Denmark from abroad; nor is there much doubt that it came from Western Europe, perhaps *via* England, though it is also found in other parts of the world. With its cutting-edge in the central plane, this celt-type is easily distinguished from the chisel-edged, though both are found on the coastal dwelling-sites. The blunt-butted celt is, however, not confined to those sites, and is found sporadically, sometimes in the shell-mounds, but only in the upper levels. As it does not occur in the graves, its period is limited in both directions, and while some would assign it to the opening stage of the late Neolithic, most are in favour of the last stage of the earlier Stone Age. It is found occasionally even as far north as Nordland, in Norway, and on the coast reaches lower levels than the Nöstvet type, evidently dating from the close of the Tapes period, when the land had risen considerably after the maximum depression. In its time the

§ This method was practised on greenstone, etc., throughout the later Stone Age in East Norway but more rarely in Westland (the district between Egersund and Aalesund). The process is described by Dr. Sophus Müller (*Mémoires de la Société Royale des Antiquaires du Nord*, 1897, p. 150).

*W. C. Brögger (*Strandliniens Beliggenhed*, p. 210) figures however, a specimen shewing transition from the Nöstvet celt with trapezoidal section to the blunt-butted type.

blunt-butted celt underwent certain modifications, and finally merges into the pointed-butt type. The earliest have an oval cutting-edge, and are widest and consequently thickest in the middle, as the section is nearly circular: also they are of small size, the later specimens being variable in this respect and gradually acquiring an oval section and angular cutting-edge, like the Megalithic celts. Several examples illustrating these changes are given by Nils Aberg (*Kalmar Läns Stenalter*). Those with pointed butt and round or broadly oval section are, on the whole, earlier than the broad-butted type (Fig. 105), the section of which is a compressed ellipse, with the sides ground flat. Both occur in the early passage-graves, and a hoard has been found in Jaederen of seven unpolished flint specimens, shewing the transition from the pointed to the broad butt. The former belongs to the first division of the later Neolithic, and the latter serves to link it with the thin-butted celt of the dolmens, or second division.

Fig. 104.

Blunt-butted Celt of Greenstone. $\frac{1}{3}$.

Fig. 105.

Broad-butted Celt. $\frac{1}{3}$.

A good deal of importance has been attached to the pointed oval section, but as an indication of date it must be handled with caution. The pointed-butt axe, of which it is a leading feature, comes between the blunt-butted with nearly circular section, and the thin-butted with squared side-edges, but it is not entirely confined within these limits, and Otto Rydbeck (*Formvännen*, 1916, p. 119) therefore prefers "pointed butt" to "pointed oval" as the name of the type. As against Stjerna (*Före Hällkisttiden*, pp. 57—60), he holds that the pointed butt dates from the later Neolithic and before the Dolmens; but derives the type from the chipped pick of the shell-mounds, which also had a rounded (oval) cutting-edge, very convex faces, and a pointed oval section. The sharp sides of the earlier form naturally produced a rounded edge, but as the sides became thicker and flattened, a straighter edge resulted, with an angle at each end of it. His paper also deals with the Viervitz (Rügen) type of celt, with the same angular edge and

pointed-oval section, which is contemporary with hollow-ground celts of the same pattern, as found in early passage-graves; and in his opinion the shell-mound axe was used not only in the early Neolithic but, as a tool, in the early part of the later Neolithic. There is a similar survival for utilitarian purposes in the history of the perforated axe.

According to the accepted classification (table on page 481), the pointed butt (Fig. 106) is the leading feature of the celt during the opening stage of the later Neolithic in Scandinavia, but so far no burials of the period have been recognised, and the precise duration of that fashion is still under discussion. More definite evidence of association and succession is derived from the earliest Megalithic tombs, which mark the *second* period, and from this point onwards there is some approach to certainty in the Scandinavian classification. There is a vast literature on the subject of

Fig. 106.

Pointed-butt Celt. $\frac{1}{3}$.

dolmens, and their well-known distribution over Europe points unmistakably to the transmission of that idea by sea, the direction being in the opinion of most authorities from the eastern Mediterranean, through the Straits of Gibraltar, and along the Atlantic coast to Brittany, Britain, and Scandinavia. These sepulchral chambers, formed of upright stones with a huge cap-stone, contained the unburnt bodies of the dead. Such a structure, standing in an oval or oblong enclosure of upright stones, is called in Danish a *langdysse* (Swedish *langdös*, French *tumulus allongé*), and when the enclosure is a ring, *runddysse* (French *tumulus circulaire*). Care should be taken to distinguish the "round dolmen" from the round barrow of Britain (which belongs to the Bronze Age); but the "long dolmen" is akin to our long barrows, inasmuch as the chamber within these Scandinavian enclosures is sometimes more advanced than the dolmen, and merges into the Megalithic type

next to be considered. The grave furniture mainly consists of the thin-butted celt (Fig. 107). As already mentioned, the broad-butted variety forms a link between the pointed and thin butt, the latter being traced to Britain, and marking an important change in flint technique. The faces are slightly convex in both directions and the sides are squared, the whole surface being finished by polishing.

The richest Neolithic finds in Scandinavia, and practically the only ones collected and studied twenty years ago, are from the Megalithic tombs of the *third* period, corresponding to the chambered long-barrows of Britain, and generally known as passage-graves (see table, page 482). Such burials are found in a restricted

Fig. 107.

Thin-butted Celt. $\frac{1}{4}$

Fig. 108.

Thick-butted Celt of Flint. $\frac{1}{3}$

area, including parts of Jutland, the Danish islands, and the south-west of Sweden (especially Bohuslän, Vestergötland, Scania, and the island of Bornholm). Discoveries have also been made apart from the burials, but the succession is best marked by the Megalithic types. The chamber is generally below the surface, and takes the form of a polygonal oval, or a rectangle, with a gallery or passage of approach. Within there was space enough for many burials, and the disturbance caused by continual additions must have destroyed many interesting associations; but there is no doubt about the leading types of grave-furniture—bone chisels and needles, perforated slate, various forms of perforated axes in diorite, amber beads in the form of axes, pottery made to stand or hang of various forms, flint thick-butted celts (Fig. 108), chisels, scrapers, blades, arrow-heads (triangular, transverse, and the long gabled form with tang), also with the later burials, flint saws, javelin-heads and early daggers (long and flat leaf-shaped). Prof.

Montelius' view is that the passage-graves with round or oval chamber are earlier than those with an oblong chamber, the latter gradually contracting to the width of the passage, and thus constituting an *allée couverte* in the stricter sense. For Sweden, 2500 B.C. is given as a central date.

The fourth stage of the Scandinavian Megalithic period is characterised by stone cists, like large coffins, made of slabs, and covered with a mound: these were used for single burials, and did not serve like the passage-graves as ossuaries. The cists of Jutland are built north-and-south, and are sometimes large enough to shew they are derived from the passage-graves. According to Prof. Montelius, they mark the transition to the Bronze Age, and represent what is left of the passage-grave after the passage had been given up (*Congrès Préhistorique, Vannes, 1906, p. 344*). In Zealand, the cists lie east-and-west; and though the broad-edged celt (Fig. 109) with thick butt (perhaps in imitation of the beaten-out

Fig. 109. Broad-edged Celt of Flint. $\frac{1}{4}$.

edge of a copper celt) was the leading implement, weapons are more conspicuous in these burials, and the later, more elaborate daggers are found in some quantity, those with the handles of triangular section being specially Danish, and the lozenge section more frequent in Sweden. These masterpieces of flint flaking are a local development, and date from a time when metal was already in use in certain parts of Europe.

The foregoing industries are correlated by Dr. A. W. Brügger as follows:—

NEOLITHIC.		SCANDINAVIA.		WESTLAND (S.W. Norway).*	
EARLY	{	Early Nöstvet		Isolated <i>tranchets</i> * (shell-mound axes)	
		Late Nösvet and blunt-butted		Vespestad	Early blunt-butted
LATE	{	Pointed to broad-butted		Westland A B	Late blunt-butted
		Thin-butted (dolmen)		Westland C	Broad-butted
		Thick-butted (passage-grave)			Thin-butted
		Broad-edged (cist)			Thick-butted
					Broad-edged

* This is a popular term for the coastal region between Aalesund (near Molde) and Ekersund (Jaederen), hence approximately that part of Norway situated west of the meridian 6° east of Greenwich.

Special interest attaches to the so-called single-graves found in the interior of Jutland, and quite distinct from the Megalithic culture of the coasts. A grave was prepared for each individual, but the graves are sometimes found in tiers, one above the other, the lowest being about 20-in. below the original surface and all having a border of stones and sometimes a floor of the same material. After a pile of wood had been burnt on the floor, the body was placed east and west in the grave with a vase, battle-axe, knife, and amber, and covered with a wooden structure before the mound was raised. These burials belong to a conquering race that invaded the peninsula from the south, and their pottery vases are of the beaker type with cordons on the neck and shoulder, sometimes alternating with incised herring-bone pattern, corresponding to Figs. *c* and *h* in *Correspondenz-Blatt (Archiv für Anthropologie)* Nov. and Dec., 1910, p. 134, the latter being apparently a blend of the zone and cord-patterns. Stjerna's comment on these finds is as follows (*L'Anthropologie*, 1910, p. 33):—The coast with its wealth of amber remained in possession of the Megalithic population; but the occupation of the northern terminus of the Elbe route by an enemy race closed this important line of communication. Consequently, during the passage-grave period the Megalithic civilisation shews no trace of contact with the south by that route. The amber went to England, or was distributed in the Scandinavian area.

The single-graves cluster in the south and west of Jutland, and there are only about 20 cases in the Danish islands, but the practice spread to Scania, across the Sound, and to Bohuslän† from the west coast of Jutland, by way of the Skager Rack. The Jutish cord-pattern pottery also spread to these areas, and Almgren describes single-graves in Sweden with ribbon ware and perforated axes (*Nagra svenskfinska stenaldersproblem: Antiquarisk Tidskrift för Sverige*, XX, p. 1). But the Swedish burials of this type are not quite homogeneous, and an intrusive element from the north has been noticed‡, indicating contact with a less developed civilisation. This is characterised by the use of slate for implements, and goes by the name of Arctic or Arctic-Baltic, being roughly contemporary with the dolmens and passage-graves of southern Scandinavia. It is spread from Finland right across the peninsula, from the Gulf of Bothnia to Trondhjem, and the settlements were chiefly in the valleys and woodlands. The people were in the fishing and hunting stage of civilisation, and seem to have been immigrants, the first to reach so far north. The extent of their occupation is shewn by the late Dr. Stjerna in a map that also gives the Megalithic and cord-pattern vase areas in Scandinavia (*L'Anthropologie*, 1910, p. 3). The slate implements include knives, spear and arrow-heads, chisel-edged and hollow-ground celts and maces of various designs. Potsherds and amber pendants have

† T. J. Arne, *Fornvännen*, 1909, p. 99.

‡ O. Frödin, *Über die Schwedisch-Danischen Verbindungen in der Steinzeit (Opuscula Oscari Montelio, p. 45)*.

also been found, but the most remarkable relics are engravings in rock or bone, and small carvings in the round of animal forms. The starting-point of this movement may throw some light on the racial affinities of the Arctic settlers, and their period has been estimated about 4000—2500 B.C. This culture is the subject of an important work by A. W. Brøgger (*Den arktiske Stenalder i Norge*, Christiania, 1909).

The perforated stone-axes of Scandinavia form an attractive series, and their chronology becomes more and more definite. The prototypes were first of horn and later of copper, and the first casting of the metal type has been traced to Hungary. Thence it spread to the east of Central Europe and travelled along the principal rivers, but is not found in France, England, or Spain,

Fig. 110. Boat-shaped Axe-hammer. $\frac{1}{3}$.

nor in Germany west of the Elbe. Somewhat paradoxically, there was a local reproduction of the pattern in stone in Norway and Sweden (especially in the south-west), generally called the boat-shaped axe, which stopped short of Jutland on the west. If the above derivation is correct, the copper type must have been introduced from the Continent in the early passage-grave period, as the boat-shaped (Fig. 110) marks the later part of that period and the early part of the following cist-period. Brøgger dates their earliest appearance about 2900 B.C., and has the following table of perforated axes :—

Period 4 : Cist-graves	{ Late, debased forms
	{ Early, boat-shaped
Period 3 : Passage-graves	{ Late, boat-shaped
	{ Early, copper type

This implies that the art of casting copper flourished in Hungary perhaps a thousand years before metal-working began either in Britain or Scandinavia.

Quite independent of the Continental Copper Age was the Scandinavian double-axe, which was apparently evolved from the

perforated mace-head ; and Nils Aberg sees successive stages of transition in the Island of Coll specimen (Edinburgh Mus. Cat., A.H. 35), Evans, 2nd edition, Fig. 145A, Fig. 129, Fig. 136A, and Fig. 137. A lenticular rather than a spherical form would be necessary to provide one or two sharp edges ; and to reduce the amount of boring, there would be a constriction or waist in the middle, and the concave edges would naturally become the top and bottom of the double-axe, which should be thought of with its perforation vertical, so that the top and bottom are approximately horizontal. The convex or curved sides or faces approach

Fig. 111. Types of Stone Perforated Axes.

the perpendicular, meeting, at least at one end, in a more or less curved cutting edge, the opposite end being known as the butt. The double axe of stone is seldom double-edged, but there is throughout a tendency to symmetry, the perforation being at first midway between the edge and butt (as in the amber models), but gradually approaching the butt. The depressions on the top and bottom were originally to reduce the labour of boring, but soon became ornamental and disappeared in the later period, leaving the surface level, even if not horizontal. Double-axes of the North seldom have any counter-sinking round the mouths of the perforation, but sometimes projections, like sockets, on the top or bottom, or on both.

Those familiar with the enormous number of perforated axes or axe-hammers in existence will understand that the subject can only be outlined here, and it will be convenient to give the four main patterns determined by Nils Aberg.

GROUP A: Axes with top and bottom very concave and approximately symmetrical (Fig. 111, *a*).

GROUP B: With top and bottom much flattened, but still symmetrical. This is known as the Fredsgard type (Fig. 111, *b*).

GROUP C: With spreading edge and butt, and the middle much flattened (Fig. 111, *c*).

GROUP D: With spreading butt, but otherwise much flattened (Fig. 111, *d*).

In Scandinavia the double-axe generally preserved a quadrangular section, though top, bottom, and sides were frequently concave or convex, and there were sometimes ornamental features

Fig. 112. Perforated Axe-hammer of Stone. $\frac{1}{8}$.

such as ridges, fillets, sunk or raised lines, sockets, etc. The boat-shaped axe, like the polygonal and facetted types, has an easterly distribution, Continental analogies being found to the south-east, while the double-edged axe points rather to the west, with analogies in the British Isles.

It was formerly held that the simpler forms of perforated axes (Fig. 112) were the earlier, and that the more elaborate were due to the gradual increase of skill and improvement in taste; but recent research has reversed the order. The finer specimens, including the best boat-shaped, belong to the time of passage-graves, and the simple forms, which were tools rather than parade weapons, date from the cist-period. To this last stage of the late Neolithic belong also the beautiful daggers that are among the chief glories of the Scandinavian Stone Age. The blade is leaf-shaped, and the handle (all in one piece) is generally of a lozenge

section, and frequently crimped along the edges as if in imitation of the stitches of a leather casing. They have been well illustrated in a paper by Dr. Sophus Müller, of Copenhagen (*Flintdolken i den nordisk Stenalder: Nordiske Fortidsminder*, Vol. I, 1903), and good specimens are figured in Brit. Mus. *Stone Age Guide* (2nd edn.), Fig. 125 (early), and Pl. 5, No. 2 (late).

Dating by years in prehistory is proverbially dangerous, but there is more evidence than usual for the periods that led up to the Bronze Age in Scandinavia. Prof. W. C. Brøgger published in 1905* the following table in connection with the various levels of the south Norwegian coast during the Neolithic and later periods :

ARCHÆOLOGICAL PERIOD.	LEADING CELT-FORMS.	CHRONOLOGY.	DURATION.
			Years.
Mesolithic (transition from early to late Neolithic)	Blunt-butted and (in part) pointed-butt	4900—3900 B.C.	1000
Later Stone Age { early late	Pointed butt (in part) Thin-butted	3900—3400 B.C. 3400—2400 B.C.	500 1000
Latest Stone or Copper Age	Thick-butted and perforated axes	2400—1900 B.C.	500
Bronze Age		1900—500 B.C.	1400
Iron Age and recent		500 B.C. to present	2400

Only the north-west angle of Germany comes strictly within the present survey ; but neither here nor elsewhere in Germany, in spite of several elaborate papers on the subject, has any general agreement been reached as to the succession of Neolithic pottery forms. The three main divisions are cord-pattern beakers (*Schnurbecher*) ; the zoned beakers (*Zonenbecher*) ; and the ribbon-pattern ware of more globular form (*Bandkeramik*). The second§ is regarded by most authorities as dating from quite the end of the Neolithic, and spread over Europe in two main streams. From some starting-point on the Mediterranean, it passed north to Hungary, Moravia, and Bohemia, and up the Danube to the Black Forest ; thence it spread over the Oder, Elbe, and Weser basins and along the Rhine (especially into Rhenish Bavaria and Hesse) to Holstein and Denmark. Another route seems to be indicated by finds in Sicily, Sardinia, Spain and Portugal, South France, Brittany, and England, more or less coinciding with the distribution of dolmens. The type was certainly connected with a brachycephalic population, quite distinct from those who made cord-pattern beakers, though a hybrid type of ware is recognised, with horizontal hatching on the more slender cord-pattern form (Goetze in *Correspondenzblatt*, Nov. and Dec., 1900, p. 135).

* *Strandliniens Belliggenhed under Stenalderen i det sydøstlige Norge* (Norges Geologiske Undersøgelse, No. 41).

§ A short bibliography of the zoned beaker is given by Schumacher in *Alterthümer unserer heidnischen Vorzeit*, Vol. V. p. 357.

Differences of opinion exist as to the relation of the two other groups. The ribbon-pattern beaker is of southern origin* and seems to have been spread northwards as far as Magdeburg by an agricultural people§ who settled on the loess areas and were quite distinct from the makers of cord-pattern ware, who were warriors and huntsmen occupying the high wooded country and controlling the main routes (Schlitz in *Zeitschrift für Ethnologie*, XXXVIII. (1906), p. 343, with illustrations and map). The two cultures existed side by side, and gave rise to a number of minor local groups of pottery, named after Grossgartach, Heidelberg, Nierstein, and Rössen. Corded ware is rarely found on the left bank of the Rhine, where the zoned and dolmen types are more numerous, often associated with celts of semi-precious stones (such as serpentine, greenstone, jadeite, and chloromelanite), with flat faces, triangular outline, and pointed butt.

In north-west Germany the three classes of beakers (with zone, cord, and hybrid decoration) are well represented, but the cord-pattern is the least plentiful; and the same may be said of the northern area, though the cord-pattern beakers are there only in a weakened (less angular) form. Another group is represented in the north-west by Megalithic ware, of which the principal forms may be compared to (i.) two cones, one inside the other, (ii.) a salad-bowl, and (iii.) a bottle with flanged mouth. According to Wilke (*Archiv für Anthropologie*, N.S. VII, 342-3), all north Germany was included in the Megalithic area, and the types here mentioned agree well with those found in Holland. A good series is illustrated by F. Tewes, *Die Steingräber der Provinz Hannover*.

A number of Neolithic hoards or group-finds have been critically examined and to some extent illustrated by K. Schumacher in *Prähistorische Zeitschrift*, VI. (1914), p. 29 (*Neolithische Depotfunde im westlichen Deutschland*). The pointed-butt celt is treated as a foreign type by Schuchhardt in *Westeuropa als alter Kulturkreis*, p. 745.

The latest and most convenient treatise on Neolithic Holland is by Nils Aberg (*Die Steinzeit in den Niederlanden*, 1916), who points out that there was a barren zone between the Campigny culture of France and the corresponding Ertebülle or shell-mound culture of Denmark. In spite of that there was communication between the two areas, and it may be that the connecting bridge has sunk below the sea. The zone in question comprises the Netherlands and the north Elbe district, and it may be mentioned that there are few (if any) dolmens between the Seine and the Elbe, and no passage-graves in France north of the Seine, nor in Belgium, nor in south or west Holland, though they occur in the east of that country and in north-west Germany. The common

* Schuchhardt traces a connection between the shape of such beakers and the gourd, in contrast to the basket-pattern design of much Megalithic pottery (*Westeuropa als alter Kulturkreis*, p. 735).

§ Wilke contends that they originally moved from the north, as far south as Lengyel, in Tolna, Hungary.

name in Holland for such a structure is *Hunebed* (giant's bed), corresponding to the chambered barrow or passage-grave of Britain. Aberg detects an ethnographical division in Holland, passing from the Zuyder Zee and Overijssel to Münster, in Westphalia, the best evidence being afforded by the celts of Period II (Dolmen division of the later Neolithic of Scandinavia). Previously, the blunt-butted celt had spread over all the Netherlands, but whereas the western variety of the thin-butted reached the Drenthe, the northern variety did not come further south than Zwolle. In Western Europe the pointed butt of Period I gave way to the thin butt of the Dolmen period, but the original pointed-oval section was retained: the bulge of the faces was reduced and the sides rounded or squared by polishing. In these respects it differed from the northern variety, which in Period III gave rise to the thick-butted with its chipped sides, unknown in the West.

The distribution is similar in Westphalia, north and south of Münster, and after Period II the development of the celt is only traceable in the north. In Western Europe the thin-butted celt retained the pointed oval section of its predecessor, the pointed-butt type, the sides being squared and polished when the unpolished thick-butted type was prevalent in the north. The two varieties are rather mixed in Drenthe and near Zwolle, but further south the western form is almost exclusively found. In the northern Netherlands the thick-butted celt occurs with battle-axes (perforated axe-hammers or double-edged) and pottery in Megalithic (passage or chambered) and single-graves, but the broad-edged variety of the 4th or cist-period in Scandinavia is not found in the Netherlands. The so-called giants' tombs are mostly found in the province of Drenthe; and in Gelderland, just south of the divide, bell-beakers appear as evidence of an independent culture, contemporary with that of the north, but coming from a distance. Though this present distribution may be due to the nature of the soil (heathland not disturbed by agriculture), the Megalithic remains of Holland shew contact with northern civilisation, and more traces may now be under water, as in Neolithic times the present coast-line passed through the centre of Holland, and low land extended much further west, but can only have been sparsely inhabited.

The pottery of the Hunebedden is characteristic and abundant, one of the Drouwen pair of tombs containing parts of at least 400 vessels, evidently related to the contemporary ware of N.W. Germany, though the earliest bottle-form was derived from Denmark by traffic along the coast.

The zoned or bell-beakers mentioned above as an exotic type probably belong to the single-grave culture of Gelderland, only one being known to come from a Megalithic tomb. They more or less resemble the British beakers, but those with an extra long neck are more akin to the type found in Thuringia and Hanover. The beaker folk buried their dead in the primary graves of round

barrows, timbers being laid over the crouching body. § Of the two types found in Holland, the later seem to be the bell-beakers, which date from the end of the Neolithic, and are found in a zone represented by Gelderland, the Rhine Provinces, Thuringia, Brunswick, and Silesia. This zone borders on the area of pure northern culture—Drenthe, Oldenburg, Slesvig-Holstein, Denmark and the Scandinavian peninsula, Mecklenburg, Rügen, and Pomerania, where the cord-pattern beaker and its derivatives are found.

A summary of the Continental types of pottery bearing on the beakers or drinking-cups of Britain is given in the introductory chapter of the Hon. John Abercromby's *Bronze Age Pottery of Great Britain and Ireland*, and reference may here be made to his paragraph (p. 13) on the Batavian type, found in Holland (his Figs. 49*—53*). The forms differ decidedly from those of central Europe, and shew a well-marked constriction at the base of the neck, which is short and sometimes upright. The plain zones have disappeared and the lower part of the vessel is sometimes left plain, but the metopic motives survive, the crosses being replaced by bars. Everything points to the Netherlands examples being later by several centuries than those of Sicily and Spain; and one (his Fig. 53*) was found in Gelderland, full of ashes and bones, on the top of which lay a bronze pin, bracelet, and socketed celt. Cremation, however, points to the latter part of the Bronze Age, and it is just possible that the vase was found and used as a cinerary centuries after its original deposit in a Neolithic tomb. Such cases have been investigated by Prof. Montelius in *Prähistorische Zeitschrift*, I. (1909), p. 78.

The perforated (battle) axes of the Netherlands comprise the double-edged type, recalling those found in Megalithic Scandinavia, as well as derivatives of the peculiar type occurring in the single-graves of Jutland. In profile, the Jutish axe has a straight or slightly convex top, more dished and consequently earlier than those of the Netherlands, which were influenced by Westphalia and Hanover. The original rectangular section becomes rounded or pointed oval, the last giving rise to the boat-shaped axe, which is, however, rarely found in the Netherlands. Contact with Denmark was lost about the end of the passage-grave period, but gradually all communication even with Hanover ceased, and there is no period of cist-graves in Holland.

A footnote in one of Dr. Rutot's many papers (*Mise au point pour 1911*, p. 93) clears the air considerably, and may be quoted by way of introduction to the Neolithic of Belgium :—"The Palæolithic period ceased as soon as the reindeer disappeared from our district, and the Neolithic began as soon as the modern fauna was established. For long there was a confusion between the Neolithic and the period of polished stone; and as the industries intermediate between La Madeleine and the age of polished stone

§ A restoration is illustrated by Holwerda in *Prähistorische Zeitschrift*, (1909), pl. XLIV.

were hardly known, the existence of a hiatus was an accepted theory. To-day this gap is largely filled by quite a series of well-marked industries."

The following summary of the various Neolithic phases in Belgium is borrowed from Dr. Rutot's *Cours de Préhistoire* (1907), the scheme referring also to Central Europe :—

1. TARDENOIS.—This industry is based on the Palæolithic Cave culture, possibly an adaptation of late La Madeleine by a people living always in the open. It consists of minute flint implements representing the five essential types (hammer, knife, side-scraper, end-scraper, and piercer), in addition to various arrow-heads. Many of these are made from small blades with parallel sides, and assume geometric forms such as the triangle and oblong. The Tardenois industry occurs almost throughout the Old World, but is nowhere abundant. This and the next group seem to cover the period represented in Denmark by Maglemose.

2. LE FLÉNU.—This industry, named from the earliest site discovered (near Mons), is quite unlike the preceding, being exceptionally rude and eolithic in appearance, altogether wanting in implements intentionally chipped. It appears suddenly, as the result of a barbarian invasion from some district where the eolithic tradition had remained unaffected by the Palæolithic. Early in the Neolithic, this people, for some unknown reason, made a brutal incursion into France and Belgium, expelling or annihilating the Tardenois population, and reaching as far north as the Baltic island of Rügen (*Le Flénusien aux environs de Liège et en Heshave*, 1909). Further extensions of this reactionary phase are noticed in the same author's *Extension en France, en Belgique, en Angleterre, et en Allemagne de l'Industrie flénusienne* (1908).

3. CAMPIGNY.—Named after the French site in Seine inférieure, this culture seems to be a local development of the preceding. The end-scrapers are carefully made, and the shell-mound axe (*grand tranchet*), unknown in the Le Flénu group, is appreciably developed ; but the industry is not abundantly represented in Belgium, which is curious, inasmuch as the country lies between north France and Denmark, where it specially flourished.

4. ROBENHAUSEN.—The name is supplied by a Swiss lake-dwelling site, and is used by Dr. Rutot in a general sense for the period when polished implements were predominant ; but in the following year (*Essai de comparaison entre le Néolithique de France et de Belgique et celui de la Scandinavie*) he suggested for the earlier types of Robenhausen (celt with very convex faces) the name of Spiennes, well known for its flint-mines ; and the later or flat-faced celts of the Robenhausen culture he preferred to call Scandinavian, as the types are best developed in the North. Both phases represent the local improvement of the Campigny group, and the implements are made with care and taste, receiving a final polish on a large slab of sandstone. It is not known if the idea of polishing flint emanated from the indigenous population or was introduced from without. This culture is widely distributed in Europe,

with local developments according to circumstances; among others industrial, defensive, and Megalithic facies can be distinguished. The population were familiar with agriculture, and no doubt had an organised social life. They buried their dead in caves, and as weapons used the polished and hafted axe, the dagger, and arrow. Contemporary with this Scandinavian phase, according to Dr. Rutot, was the following or last stage of the Neolithic in Belgium and Germany.

5. OMAL.—This culture, named after a site near Brussels, seemed to be almost confined to the east of Europe, though it reached the plains of the Hesbaye, and was apparently carried by Oriental invaders from the south-east. It never reached Denmark or the Scandinavian peninsula, where the preceding culture continued to flourish. The Omal group does not include polished flint axes, the stone industry consisting of blades recalling La Madeleine. With these are found perforated axe-hammers often of crystalline stone (which occur also after the introduction of metal), and coarse pottery with minute handles or lugs, the finer specimens having a peculiar decoration. The newcomers took to living in villages, chiefly in Hesbaye, and seem to have been the advance-guard of migrant Orientals, who presently brought the knowledge of metal to the West.

In two of Dr. Rutot's papers a certain group of flint implements is assigned to the earliest phase of what is generally known as the Drift period [*Sur l'Age des gisements de silex taillés Canton de Binche, Hainaut* (1898); and *Le Préhistorique dans l'Europe Centrale* (Namur, 1904)].

One of his critics is Rademacher, of Cologne, who contends that the *ergeron* and brick-earth under which the alleged Chelles and Strépy types are found in the Haine valley, for instance, correspond not to the deposits so named of the Somme, nor to the early loess of the Rhine, but to its valley loess (Talloëss), a much later deposit; consequently the novel forms attributed to the early Drift are in reality early Neolithic, surface-specimens that have never been covered with a geological deposit. The alternative argument that the novel types referred to are forgeries has had to be abandoned; and the early Campigny period to which they are relegated in the *Prähistorische Zeitschrift*, IV. (1912), p. 237, includes also the well-known series of Rügen, Spiennes, and Presigny. The Flandrian period of Rutot implies that North Belgium was below the sea during the deposit of *ergeron*, and this depression of the land has been connected with the Littorina depression of Scandinavia and the Bühl glaciation (the last in Jas. Geikie's system for Scotland). The important point is that on this theory the macrolithic industry (manufacture of large implements as opposed to the microliths or pygmies of Mas d'Azil and Tardenois) must have been re-invented, and the hand-axe went through the process of evolution a second time. About this there can easily be two opinions, nor is it at all certain that the Neolithic celt was derived from the shell-mound axe or *grand tranchet*.

The Neolithic literature of France has been so ably handled by the late Capt. Déchelette that individual references would be superfluous; but he himself confessed in *Manuel d'Archéologie*, I., p. 336, that the current classification of this period in France is anything but satisfactory. "On a final review, one must confess that at present the various attempts at a chronological division of the Neolithic in western Europe have not resulted in anything definite. Certain objects can indeed be separated by typological methods into early and late types, but at present no precise idea of the successive phases is possible, in spite of the length and importance of the period. For some years past, particularly in Germany, this gap in our knowledge has been recognised, and efforts have been made to obtain a new criterion for classifying the finds. Ornamented pottery, which is found in great variety and abundance, has been thought likely to serve as a type-fossil for the Neolithic horizons, but these inquiries, interesting as they are, have not yet brought a solution of what remains an obscure problem."

Two leading types of the Campigny group are closely associated with the shell-mounds of Denmark, and are generally considered to be characteristic of the earliest Neolithic period. It should be noted in this connection that the shell-mound axe has been found in a Pleistocene deposit of brick-earth (late, but still Palæolithic) at Havre (*Revue Préhistorique*, II., pp. 158-9), a fact that throws some light on Déchelette's treatment of Campigny, the period so named having been determined by Salmon in 1886. The controversy that has arisen as to this "station" in the commune of Blangy-sur-Bresle (Seine-inférieure, 25 miles east of Dieppe) is thus summarized in the *Manuel*, I., p. 327:—"The Campigny question has been the subject of many acute controversies among French prehistorians. Is it simply a local facies of the Neolithic industry, limited not in time but in space? Ought we, on the contrary, to regard it as one of the chronological divisions of the Stone Age? The opinions of those best qualified to judge are divided, owing to various circumstances—the extreme rarity of stratified Neolithic deposits: our imperfect knowledge of sites dating from the period of polished stone; and the want of any Campigny burial. Such being the case, there is need (he says) of circumspection in identifying the Campigny industry with a definitely early stage of the Neolithic."

If the place of Le Campigny in the Neolithic scheme is still in doubt, the scheme itself is even more problematic in other particulars, and Déchelette could not accept any of the classifications hitherto proposed. The best known is Salmon's (reproduced in the British Museum *Stone Age Guide* (2nd edn., p. 96), which is open to several objections. In the first place, it is based on an illogical comparison of habitation-sites and sepulchral monuments; and the pottery found in the *fond-de-cabane* at Le Campigny is anything but primitive, and closely resembles in decoration the larger and more complete series from the camp of Chassey (Saône-

et-Loire), which is equated with Robenhausen and the principal Neolithic pile-dwellings of Switzerland, of the following period. Further, the small polished stone celts of the third (Carnac) period must be a local development, and cannot be considered as typical of France in the last stage of the Neolithic.

Of the recognised groups of pottery, corded ware is not characteristic of France, but ribbon-ware is found in the country, though wanting in Britain. The typical Neolithic vase is known as caliciform (zoned, bell, or tulip beaker), which dates from the end of the period in Brittany and from the early Bronze Age in the south of France. It should be noted that it is not represented on the important Neolithic site of Chassey.

The best polished celts come from the Megalithic burials of Brittany, but for the rest, little advance has been made on G. de Mortillet's division into (i.) triangular outline, (ii.) rectangular section, and (iii.) cylindrical. More recently, several hoards or associated finds have been critically examined, with a view to a more rigid classification (*L'Homme Préhistorique*, 1907, p. 72). The development of the celt, at least in its later stages, was not parallel to that of Scandinavia, but the perforated axe-heads certainly point to the north-east, and several boat-shaped specimens have been found in the central departments of France, while the dolmens of Brittany have yielded double-axes. There is reason to believe that the bow-drill was used in Neolithic Europe.

It has been calculated that there are 4458 dolmens and passage-graves in France; and though the term *allée couverte* strictly refers to a covered passage of slabs, the same width throughout, it is generally used as equivalent to passage-grave, with a chamber or chambers of varying size and plan. M. Adrien de Mortillet contends that all were constructed underground, or covered with a mound of earth or stones (*galgal*), whereas in Prof. Montelius' opinion Megalithic structures were often left bare, as many are found to-day. Cremation is frequently found in the Megalithic burials of Brittany, though the practice of burning the dead is generally rare among Neolithic peoples, who belonged to two main racial types: (i.) long-headed, called the Baumes Chaudes type, akin to the Palæolithic Cro-Magnon, and considered indigenous; and (ii.) short-headed, named after Grenelle and Furfooz (Belgium), especially in the north-east and further south in the departments of Savoie, Isère, and Drôme: evidently due to an invasion from the east.

As the dolmen-area includes most of the countries under discussion, a few lines must be devoted to this formidable problem of origin and distribution. In north Germany there are no true dolmens east of the Oder or south of Mecklenburg; and Megalithic chambers of any description are of extreme rarity between Holland and Brittany, except in the Seine basin. Almost all varieties abound in Brittany, but the dolmen is supreme in southern France. According to L. Zinck, there are still greater gaps in the case of passage-graves, which to a certain extent tell against both the

rival theories of Megalithic distribution. The more widely accepted hypothesis is that formulated by Prof. Montelius, of Stockholm, at the International Prehistoric Congress at Stockholm, in 1874, but since modified in certain particulars. § In his opinion, the idea of Megalithic tombs was transmitted from the east, or more precisely Egypt and north-west Africa, through the western Mediterranean and along the Atlantic coast of Europe to Britain, Germany, and Scandinavia. It was at first thought that the passage-graves developed locally from the dolmens, but it is now held that the two types represent different waves of culture along the same route, and that hybrid forms developed after the passage-graves had been introduced.

Another school of thought is represented by the Danish archaeologist, L. Zinck, who thus sums up the arguments of his book on the stone graves of the Dolmen-area in northern Europe (*Det nordeuropæiske Dyse-territoriums Stengrave*: Copenhagen, 1901):—The known facts everywhere lead one to believe that the practice of building dolmens started in the north, and that it spread over north Germany and then to France and the Iberian peninsula. The favourite hypothesis, in favour of the opposite direction, stands or falls with the belief in a real connection among all dolmens, wherever found, and in their derivation from the east. Such a connection is inconceivable, on account of the great intervals of time and space between the different groups, not to mention the fact that nothing proves the Oriental dolmen to be the earlier. The presence of these remarkable tombs in so many places and in so many periods can only be explained by the root-idea being common to all humanity. It may be added, as an antidote to Zinck's arguments, that the principle of historical continuity and distribution by migratory peoples has been recently upheld in several papers by Prof. Elliot Smith, of Manchester.

The two opposing views as to the current of civilisation in Neolithic Europe are generally known by their mottoes, and have been ably upheld by leading archaeologists, though a final verdict (which may be a compromise) is still awaited. Prof. Montelius and Dr. Sophus Müller, of Copenhagen (especially in his *Urgeschichte Europas*, 1905) agree in deriving the culture of northern Europe from the eastern Mediterranean: *ex Oriente lux*; while the weak points in that theory have been indicated and rebutting evidence adduced by M. Salomon Reinach (*Le Mirage Oriental*, in *L'Anthropologie*, 1893, pp. 539, 699) and by Karl Penka (*Die Entstehung der neolithischen Kultur Europas*, 1907).

§ See on the whole subject his treatise on the influence of Oriental culture on Europe to the 5th Century B.C., in *Antiquarisk Tidskrift för Sverige*, XIII. (1905): *Orienten och Europa* (German edition, *Der Orient und Europa*, 1899).