The Iron Age North of the Alps

Iron technology enabled prehistoric woodland Europeans to create rich exurban cultures and tribal chiefdoms.

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Of all the periods of prehistoric culture in Europe, perhaps the Iron Age has been least synthesized. This must seem strange to the nonspecialist, for the theoretical significance of the time when Europeans began to use iron must of necessity be great, inasmuch as the chief distinguishing feature of European-born Western Civilization has been its highly developed technology based ultimately upon iron and steel as the basic material for edge tools, including those used for constructing other tools and goods. While the continued paramount position of Western Civilization among world culture seems debatable today, there still remains no doubt that the peoples of the world are clamoring to adopt its technology. The implications of the rise of developed European woodland cultures in association with iron technology, which apparently had little effect on cultural growth in the Near East, remain largely unexplored, undoubtedly because of the neglect of Iron Age studies. Recent clarification of chronological problems in the Iron Age of Central Europe (*1*) promises, however, to provide a new impetus to research.

Iron technology as the basis for most cutting and other manufacturing tools had become established over all of subpolar Europe by 500 B.C. The spread of the knowledge of ironworking techniques seems not to be closely tied to any extensive migrations, but was acquired more or less gradually among established populations. The major Iron Age cultural areas of Europe north of the Alps correspond more or less to the great ethnic groups there at the ethnohistoric horizon. The Western Hallstatt and the subsequent La Tène traditions of Atlantic and Central Europe go along chiefly with the Celts, the Eastern Hallstatt and its later continuation, mostly south of the eastern outliers of the Alps, associates with Illyrians, while the North European Lowland Iron Age coincides closely with Germanic distributions. The Balts and Slavs have less clear archeological affiliations, although such complexes as the Lusation–Bell Grave tradition, rather like the North European Lowland Culture, seem to be connected with these peoples. While these correlations may not necessarily be perfect, the correspondence seems sufficient for indicating that the ethnic significance of archeologically detected cultural groupings is rather greater than commonly accredited in the theory of prehistoric studies. These identifications have been made by using the method called, by American Indian archeologists, "the direct historical approach," whereby an ethnic group's cultural remains, located with the aid of ethnohistoric sources, are excavated and studied and the particular tradition thus identified is followed in space and backward in time. In Europe, most of these traditions can be traced back to somewhat before the start of the Iron Age. These identifications are considered to be so secure that some prehistorians use the terms Celtic and La Tène, Eastern Hallstatt and Illyrian, North European Lowland Culture and Germanic, interchangeably. Since ethnic identity and archeological culture are two conceptually distinct categories, however, this practice ought to be avoided. Likewise, the term Scythian, at most, should be used only for the Scythian tribe, and their cultural relatives with similar ecology should be called by some other term. Hugh Hencken's (*2*) recent study on early Etruscans exemplifies an attempt to solve one of the most difficult of these problems of identification.

The new ironworking technology did not originate in Europe, but seems to have been gradually acquired north of the Alps from about 1000 B.C. to 700 B.C. Experimentation with iron had long been carried on in Anatolia, and a prototype sword was buried near Troy as early as 2500 B.C. However, it was not until the later centuries of the Hittite Empire that Anatolian smiths actually made from iron a better cutting material than skillfully cast and worked bronze. For a short time iron (actually low-grade steel) weaponry was maintained as a relatively well-kept military secret by the Hittites, but with the breakup of the Hittite Empire around 1200 B.C., seemingly partially occasioned by invasion from central Europe, as well as other factors, the secret and the smiths became widely diffused in the Near East and the eastern Aegean.

Once the military and political advantage of unilateral possession of iron weapons had been lost, iron technology seems not to have made much of an impact on cultural developments in the Near East, and indeed, during the Early Iron Age of Greece, from 1000 to 700 B.C., that region actually relapsed from a literate, historic level to a "prehistoric," nonliterate condition. Iron metallurgy had become established in Italy soon after 1000 B.C. but diffused more slowly to the western Mediterranean. During the centuries from 1000 to 700 B.C. may be noted the sporadic appearance of iron knives, swords, and trinkets in Europe north of the Alps. By 700 B.C. in the southern half of continental woodland Europe, most of the basic cutting tools were made of iron. This territory is that occupied by the Hallstatt Culture, named after a prosperous salt-mining center in Austria (*3*). This culture actually extended into the northern Balkans, which were thereby central European in main cultural affiliation.

Hallstatt Iron Age Culture

Even during the first phase, Hallstatt I, about 730–600 B.C. (*2*, *4*; Fig. 1, upper left), a kind of low-grade steel was made when smiths hammered carbon into the metal during the forging process, as they were incapable of producing high enough temperatures to smelt and cast iron. The potentialities of iron were not perceived at first, and

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basic tool types remained essentially those of the Bronze Age, except made bigger to take advantage of the greater tensile strength of iron. Long iron swords (Fig. 1, left, 1) over a meter in length were forged for aristocratic tribal warriors who now fought from horseback (*5*). The graves of these warriors, and those of their female counterparts, are much better supplied with artifacts than are those of the great majority of Hallstatt I burials, although, expectedly, such differentiation in status varies considerably from region to region of the Hallstatt Culture. In east-central Europe men and women of extremely high status were buried with four-wheeled wagons. Although this Hallstatt-I-phase culture is clearly a direct outgrowth of the late Bronze Age Urnfield Culture, it is marked by

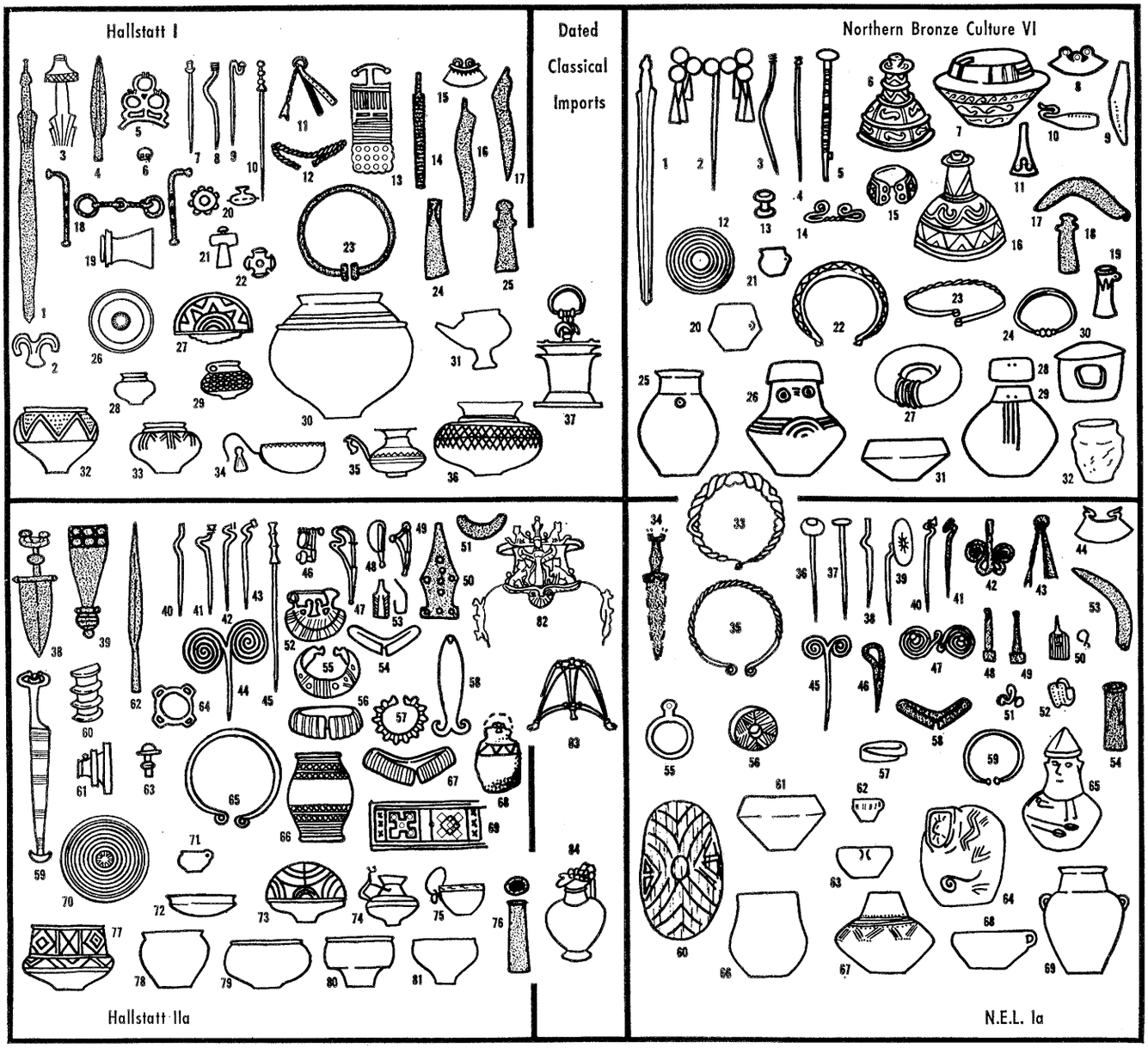

Fig. 1. Chronological horizon-markers and characteristic artifacts of Hallstatt I (about 730–600 B.C.) and Hallstatt IIa (about 600–530 B.C.) and the respectively contemporary Northern Bronze VI and North European Lowland Iron Age Ia. Objects usually in iron are stippled, and those in wood are striated. Hallstatt I (upper left): 1–3, swords and chape; 4, spearhead; 5–6, harness fittings; 7–10, pins; 11, toilet set; 12, bracelet; 13, belt hook; 14, file; 15, razor; 16–17, knives; 18, horse bits; 19, wagon wheel nave; 20–22, ornamental fittings; 23, neck ring or torc; 24–25, winged and lugged axes; 26, harness disk or phalera; 27–33, 36, ceramic vessels; 34–35, bronze vessels; 37, imported Etruscan bronze vessel (*4*). Hallstatt IIa (lower left): 38–39, dagger and scabbard; 40–45, pins; 46–49, 52, safety pins or fibulae; 50, 58, belt hooks; 51, razor; 53, earrings; 54–57, 66–67, bracelets; 59, single-edged sword and scabbard; 60–61, 63, wagon fittings (*40*); 62, spearhead; 64, loop-ring (*40*); 65, torc; 68, stone sculpture (*41*); 69, bronze belt plate; 70, phalera; 71–73, 77–81, ceramic vessels; 74–75, bronze vessels; 76, socketed axe; 82–83, imported Etruscan bronze vessel (*42*) and tripod; 84, imported Rhodian flagon (*40*). Northern Bronze VI (upper right): 1, sword; 2–5; pins; 6–7, 16, belt ornaments; 8, 10, razors; 9, knife; 11, tweezers; 12, phalera; 13–14, ornaments of uncertain usage; 15, 24, 27, bracelets; 17, sickle; 18–19, lugged and socketed axes; 22–23, torcs; 20–21, 25–26, 28–32, ceramic vessels, 26 and 29 being face urns, and 30 a house urn; 33, torc which also dates from the next period. North European Lowland (N.E.L.) Iron Culture Ia (lower right): 34, imported Hallstattian dagger (*43*); 35, torc; 36–41, 45, pins of iron or bronze; 46–47, fibulae; 42, 48–49, belt hooks; 43, toilet set; 44, razor; 50–52, earrings; 53, sickle; 54, axe; 55, loop-ring; 56, engraved stone; 57–59, bracelets; 60, shield, as represented on face urns; 61–69, ceramic vessels, 64 being a house urn (*44*), and 65 a face urn. All N.E.L. artifacts except 34 are from closed grave or hoard finds.

changes in style and fashion, an eternal process where human cultures are concerned. One of these changes, seemingly sparked by a renewed interest in hematite and other iron ores, sees the revival of the painting of pottery, a custom dead for millenia, in red and shiny black graphite, the latter of which reproduced somewhat the dark luster of the new metal. With the release of large quantities of bronze from the requirements for making tools, there is also a resurgence in the making of jewelry, often elaborately cast and engraved, undoubtedly highly pleasing to Hallstattian canons of taste. The safety pin or fibula, invented, apparently in Central Europe, about the 13th century B.C., was the object of much of this applied art and in those days the pins that held one's clothing were a source of pride. Another recurrent item of dress all through the Iron Age of Europe north of the Alps is the neck ring, or torc, which constituted not only an ornament but also a sort of amulet, conferring on the wearer some kind of supernatural benefit (*6*; *7*, p. 99). Whether tied in with the diffusion of iron and resultant economic stimulation or not, some trading contact with the Mediterranean world was begun, and absolute dates are inferred from the extremely rare occurrence of Mediterranean artifacts in these contexts (Figs. 1, 2, 3, 4, central columns).

During the subsequent phase, Hallstatt II, a greater effort was made to realize the full potential of iron, and for the first time new forms more suited for the new material appear. Iron technology had by this time become established in Great Britain, whether brought by invasion or not (*8*). In Central Europe, at least, technological and stylistic change proceeded rapidly, with two phases, Hallstatt IIa (600–530 B.C.) (Fig. 1, lower left) and IIb (530–480 B.C.) (Fig. 2, upper left), being distinguishable even in the Iron Age's relatively unstudied state.

While the design of tool types appropriate for the properties of iron and the problems of its production must certainly have come from the increasing familiarity with the new material, part of the inventiveness was undoubtedly stimulated by markedly changing conditions in the human and natural environment. Eurasiatic steppe nomads, herders, and river valley farmers (of whom the Scythians are the tribe best known from ethnohistory, but there must have been other tribes involved), attacked, sometimes successfully, the Hallstattian peoples of east-central Europe (see map, Fig. 5). The latter responded by building a series of fortified centers protected by earthen ramparts set with wooden stockades, which, along with some log cabin constructions, recall in appearance Euro-American frontier forts (*9*).

These intense attacks had possibly been preceded by incursions from the steppe during the previous two centuries, although recent studies demonstrate that these early movements were rather limited (*10*).

The defense against steppe nomad onslaught was aided by changing climatic conditions: rainfall and occlusion had been steadily increasing since the beginning of the Iron Age, moving, so to speak, the woodlands farther east just when the steppe peoples were trying to take advantage of the new weaponry and mobility of the horse to try to extend their territories to the west. The new Sub-Atlantic climatic phase was by no means exclusively a blessing, however, what with rainfall increasing about 5 percent, the temperature down at least 1°C, and total humidity up 15 percent in already damp western Europe (*11*). Trackways, forest, and arable land were at places covered by swamps and bogs, and heather spread menacingly, particularly in the north.

Fortified centers are found widely over the Hallstatt territory, including those places seemingly never menaced by the steppe nomads. Around these centers are often found rather lavishly equipped burials of ostensibly chiefly folk. All over the Hallstatt area these sometimes contain four-wheel wagons, sometimes also pitchers, urns, jars, and vases produced in Etrusucan and Greek workshops. Broken remains of Greek ceramics occur in such fortified centers as Vix, in Burgundy, and the Heuneberg, in Bavaria (*12*). The latter settlement also in early Hallstatt II times attempted to build, after a Mediterranean pattern, a bastioned defensive wall of mud bricks. Such an ecologically ill-considered innovation was eventually abandoned, fortunately, for them, before any Scythians appeared on the scene.

It is little known among nonprehistorians that by Hallstatt IIb times, central Europeans were producing a statuary art almost as sophisticated (although stylistically clearly different) as that from contemporary Archaic Greece! Such a statue is known from Hirschlanden (Württemberg), Germany, from an impeccably secure archeological context, having been excavated under well-controlled conditions, and is also dateable by the ornaments and weapons depicted being worn by the warrior (*13*; Fig. 6).

Early La Tène Iron Age Culture

Such artwork continues in subsequent cultural development, called the La Tène Iron Age, named after a lakeside votive deposit site in Switzerland (*14*). Although a direct outgrowth of the Hallstattian tradition, the hallmark of the period is the dramatic, rhythmic sinuosity of the new La Tène art style. A great tradition, the La Tène art style, emerges as an original synthesis of native, Etruscan, Italic, Greek, Scythian — perhaps even Chinese — elements (*15*) as well as some of those from the Northern Bronze Age, the characteristic art of which (Fig. 1, right, 6, 7, 16) evaporates upon the establishment of an iron technology on the North European Plain. More significantly, there is now developed an entire series of tools more appropriate for iron. Although the first phase, La Tène Ia (480–400 B.C.) (Fig. 2, bottom left), was studded with rather clearly distinctive regional cultures, such as the Salznach in Upper Austria (source of good iron, salt, and copper ore), the Hunsrück-Eifel in the Rhineland (iron and copper ore), and the Marne Culture in Champagne (the chalk plains of which provided well-drained, traversable land at the very peak of the Sub-Atlantic climate), nevertheless these regional cultures are variations on the same theme and have many features in common. Some hand tools, such as woodworkers' saws, chisels, files, and gouges, take on the same appearance as they still have as seen in a modern hardware store, although, strangely, the shaft-hole axe does not really become common until later, the socketed axe being preferred for a long time. Occasionally a kind of rudimentary screw is made, for mounting handles, by obliquely scoring the shank of the metal tang.

The extensive contacts exemplified by early La Tène art probably accompanied trade more than warfare. Great quantities of amber from the Baltic as well as glass beads, coral, and occasionally Etruscan bronze and Greek ceramic vessels are found in La Tène contexts, with the Mediterranean vessels providing much of the basis for the absolute chronology. Although iron re-

placed bronze for cutting implements and tools, more and more jewelry was manufactured in bronze and buried with individuals, so that much copper and tin had to be traded around within the La Tène world as well.

While the more eastern regional cultures' artwork shows clearly their experiences with the Scythians, for the most part the major danger seemed to have passed, for again and again the great Hallstatt IIb forts are voluntarily abandoned and by the time that La Tène Ia styles are well established the towns, such as Vix and the Heuneberg, are deserted, with settlement reestablished in smaller, more accessible villages. At Haulzy, in the Argonne forest

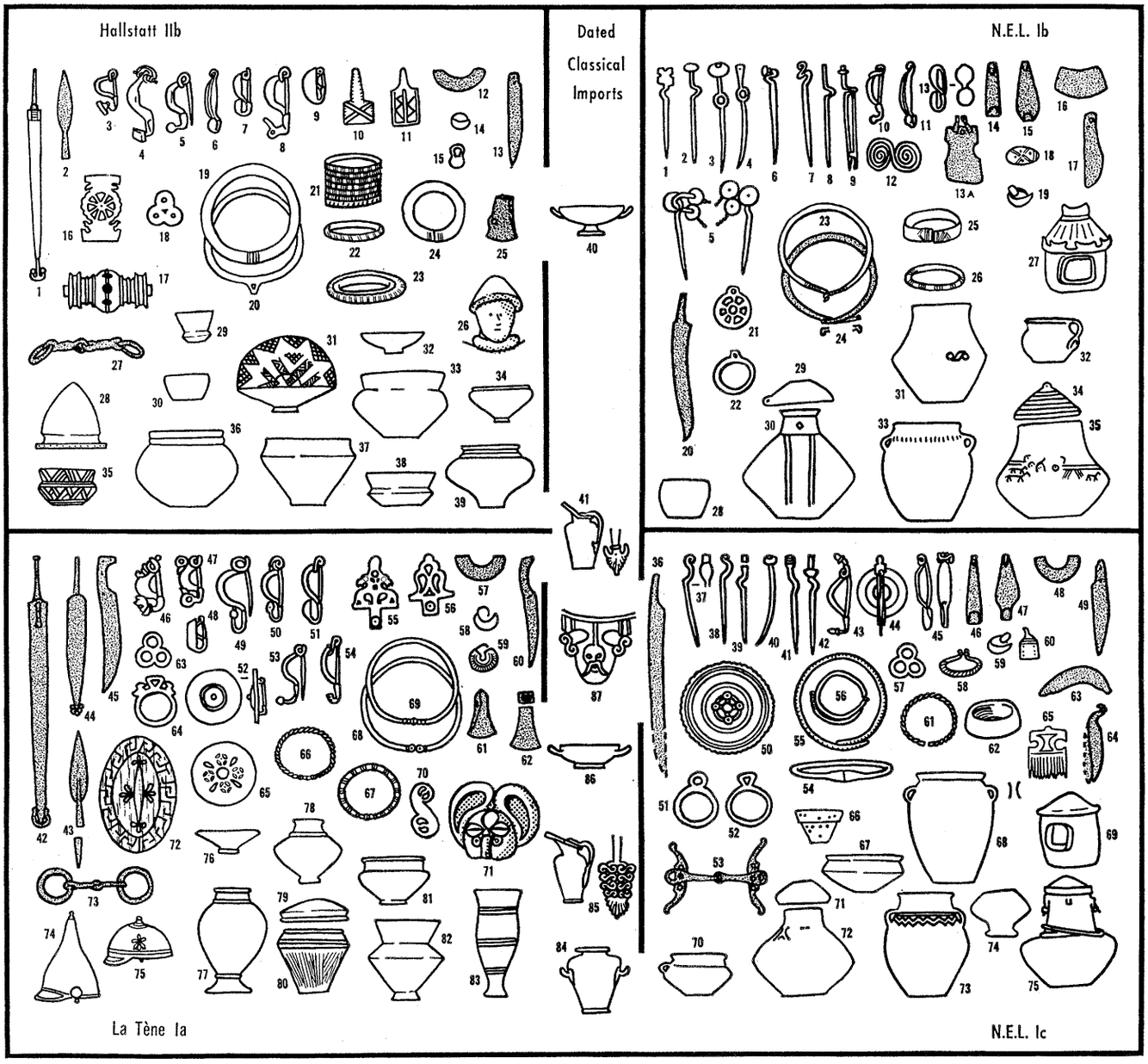

Fig. 2. Chronological horizon-markers and characteristic artifacts of Hallstatt IIb (about 530–480 B.C.) and La Tène Ia (about 480–400 B.C.) and the respectively contemporary North European Lowland Ib and Ic. Objects usually in iron are completely stippled, those in wood, striated. Hallstatt IIb (upper left): 1, iron dagger in bronze scabbard; 2, spearhead; 3–9, fibulae; 10–11, belt hooks; 12, razor; 13, knife; 14–15, earrings; 16, phalera for wagon (*45*); 17, wagon wheel nave (*45*); 18 pendant; 19–20, torcs; 21–24, bracelets; 25, axe; 26, stone sculpture (*13*); 27, horse bits; 28, helmet; 29–39, ceramic vessels; 40, Greek black-figure and low-foot ceramic cups; 41, Etruscan flagon also imported during the earlier part of the next period. La Tène Ia (lower left): 42, sword; 43, spearhead and shaft ferrule; 44, dagger; 45, single-edged sword; 46–47 (*46*), 48–54, fibulae; 55–56, belt hooks; 57, razor; 58–59, earrings; 60, knife; 61–62, shaft-hole and socketed axes; 63, pendant; 64, loop-ring; 65, phalera; 66–67, bracelets; 68–69, torcs; 70–71, Early Style design and stone sculpture; 72, shield, as depicted in engravings; 73, horse bits; 74–75, helmets; 76–83, ceramic vases; 84, Etruscan bronze jar imported into both La Tène and N.E.L. Ic; 85, later-style Etruscan flagon; 86, Greek red-figure cups; 87, Etruscan cauldron handle found in Denmark in N.E.L. context (*27*). North European Lowland Ib (upper right): 1–9, pins of bronze or iron; 10 (*47*) to 13, fibulae of bronze or iron; 14–15, belt hooks; 16, razor; 17, knife (*47*); 18–19, earrings; 20, single-edged dagger (*47*); 21–22, loop-rings; 23–24, torcs; 25–26, bracelets; 27–35, ceramic vessels, 27 being a house urn, and 35 a face urn. (*47*). North European Lowland Ic (lower right): 36, single-edged sword (*27*); 37–42, pins of bronze or iron; 43 (*47*) to 45 fibulae; 46–47, belt hooks; 48, razor; 49, knife; 50, phalera; 51–52, loop-rings; 53, horse bits (*47*); 54–55 (*48*), torcs; 56, 61–62, bracelets; 57, pendant; 58, finger ring (*26*); 59–60, earrings; 63, sickle; 64, scissors (*27*); 65, bone combs; 66–75, ceramic vases, 69 being a house urn and 75 a face urn (*48*). All N.E.L. artifacts are from closed finds.

of Lorraine, a rather backwoodsy group stayed in their fort for three generations longer. In Champagne, where settlement patterns have been studied more closely (*16*), rather elongated villages were established with one or more rows consisting of four to six houses all in alignment.

A close analysis of finds suggests that in some areas such as that of the Marne Culture, there existed rather small tribally based chiefdoms. In one such ostensibly tribal group, almost every adult male, and some females, of the upper class were buried with two-

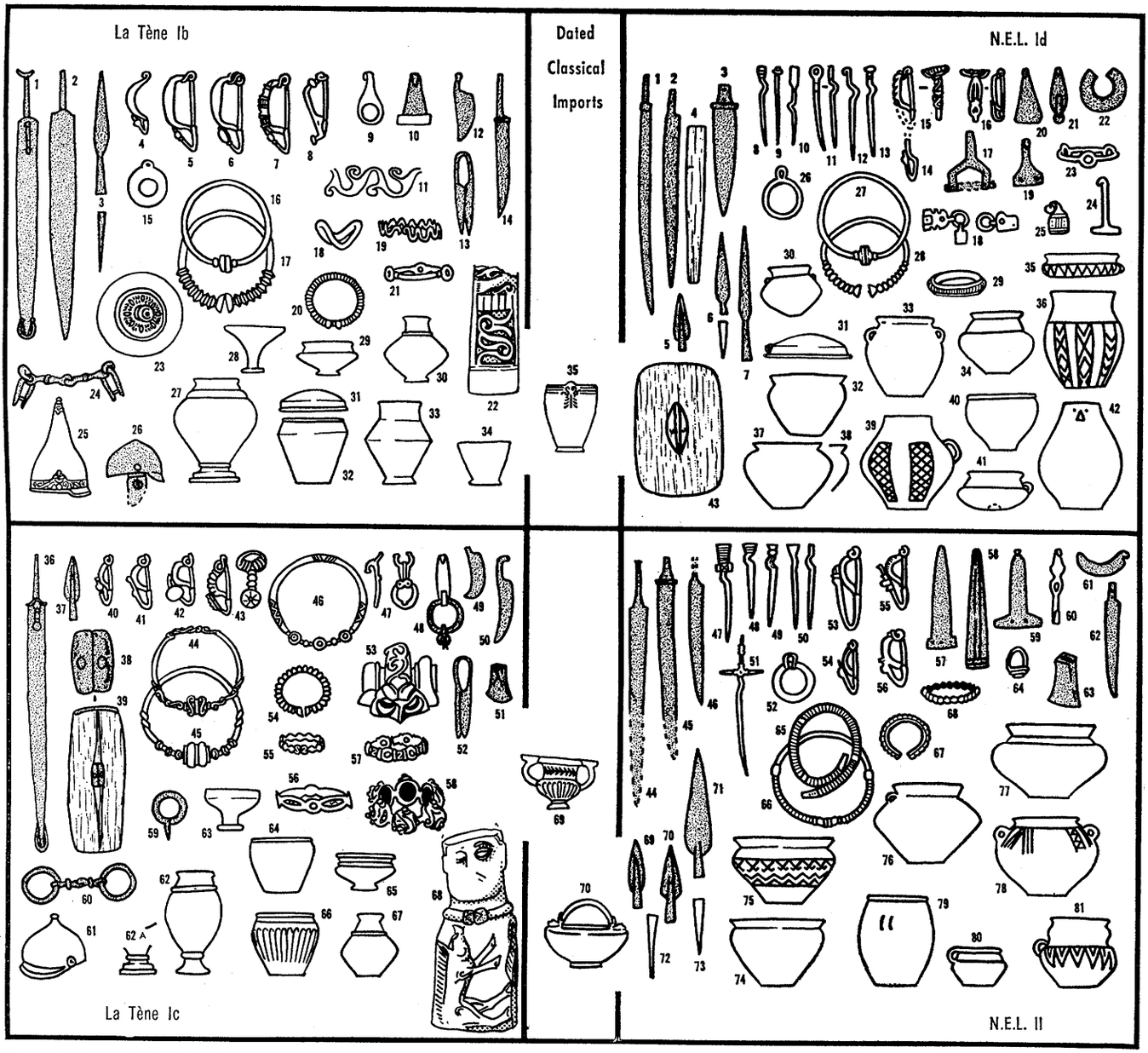

Fig. 3. Chronological horizon-markers and characteristic artifacts of La Tène Ib (about 400–300 B.C.) and Ic (about 300–200 B.C.) and the respectively contemporary North European Lowland Iron Id and II. Objects usually in iron are completely stippled, those in wood are striated. La Tène Ib (upper left): 1–2, swords in scabbards; 3, spearhead and shaft ferrule; 4–8, fibulae; 9–10, belt hooks; 11, Waldalgesheim Style design; 12, razor; 13, shears; 14, knife; 15, loop-ring; 16–17, torcs; 18–21, bracelets (18 also shows the form of finger rings); 22, sculpted stone stela; 23, phalera; 24, horse bits; 25–26 (*49*), helmets; 27–34, ceramic vessels; 35, Classical bell bucket (*situla*) imported into both La Tène and North European Lowland areas. La Tène Ic (lower left): 36, sword; 37, spearhead; 38, shield boss; 39, shield known from undecayed remains recovered archeologically; 40–43, fibulae; 44–46, torcs; 47–48, belt hooks; 49, razor; 50, knife; 51, axe; 52, shears; 53, Plastic Style cauldron handle attachment (*50*); 54–58, bracelets; 59, chariot rein-guide; 60, horse bits; 61, helmet; 62–67, ceramic vases; 68, stone statue dating from either La Tène Ic or II; 69, Campanian imported vase (*51*); 70, Classical Etruscan bronze cauldron imported into North European Lowland (*52*). North European Lowland Id (upper right): 1–3, single-edged swords; 4, wooden scabbard; 5–7, spearheads with bone shaft ferrule; 8–13, pins of bronze or iron; 14–16; fibulae; 17 (*53*) to 21, 24, belt hooks; 22, razor; 23, 29, bracelets; 25, earring; 26, loop-ring; 27–28, torcs; 30–42, ceramic vessels [42 is a face urn found with fibula 16 (*54*), vase 38 was found with fibula 14 (*26*), and 32 was found with weapons 1–7, 43 (*55*)]; 43, wooden shield preserved in peat bog. North European Lowland II (lower right): 44, sword, La Tène–made (?); 45–46, single-edged swords (*55*); 47–51, pins of bronze and iron; 52, loop-ring; 53–56, fibulae; 57–60, belt hooks; 61, razor; 62, knife; 63, axe; 64, earring; 65–66, torcs; 67–68, bracelets; 69–73, three spearheads with two bone shaft ferrules (*55*); 74–81, ceramic vases. All N.E.L. artifacts are from closed finds except Krogsbølle weapons Nos. 44–46, 69–73.

wheeled chariots. Practically all adult males in burials without chariots were armed, and the corresponding set of female burials are bedecked with much jewelry. Despite such virtually universal armament in some quarters, hardly any skeletons exhibit osteological scars indicative of wounds received in combat.

Nevertheless, this recurrently asserted right to bear arms was no mere ritualistic formality, as subsequent events testify. While La Tène Ib (400–300 B.C.) and Ic (300–200 B.C.) (Fig. 3, left) witness less radical changes in material inventory (although chain

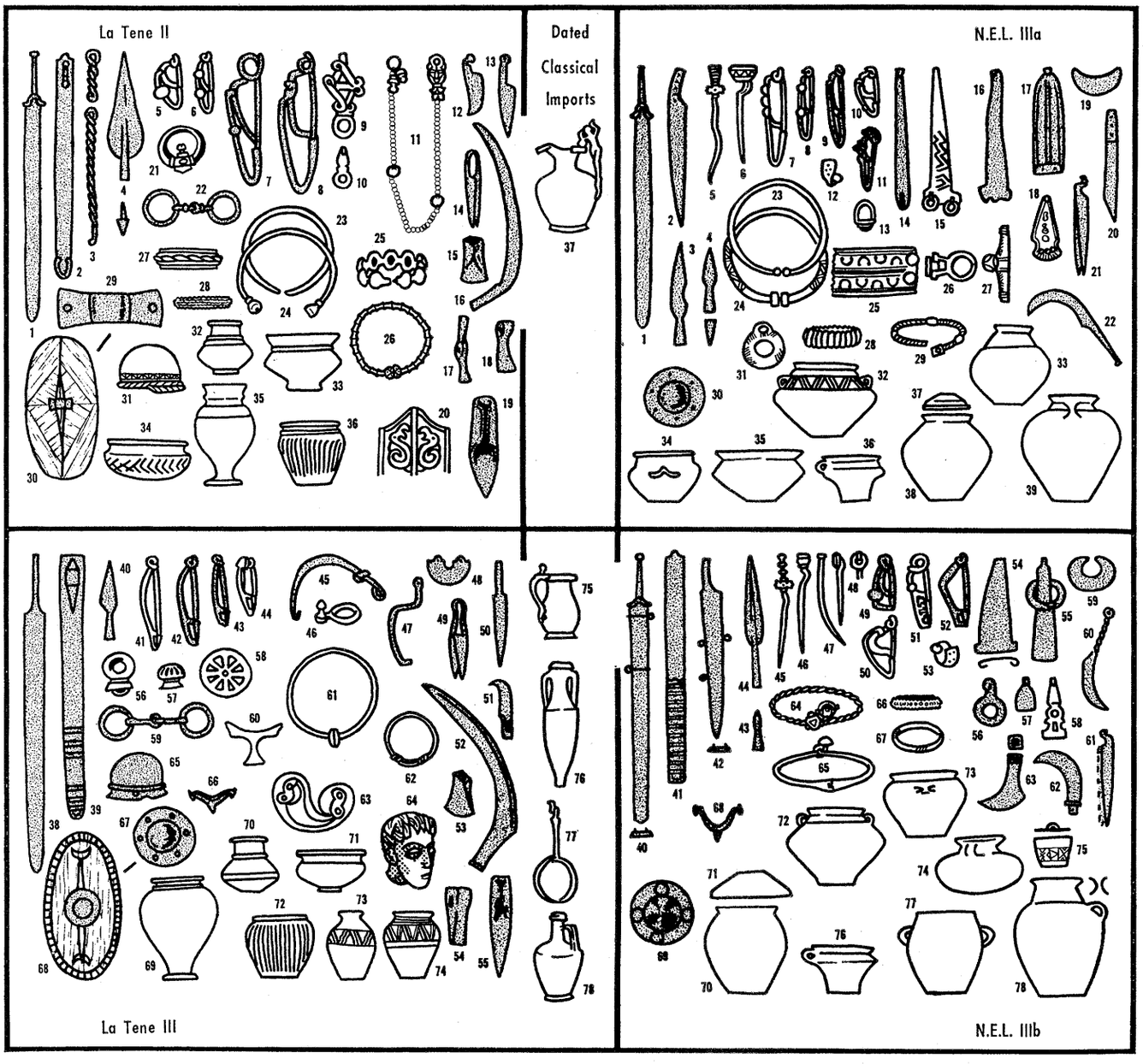

Fig. 4. Chronological horizon-markers and characteristic artifacts of La Tène II (about 200–100 B.C.) and III (about 100 B.C. to A.D. 1) and the respectively contemporary North European Lowland IIIa and IIIb. Objects usually in iron are completely stippled, those in wood are striated. La Tène II (upper left): 1–2, sword and scabbard; 3, sword suspension chain; 4, spearhead and shaft ferrule; 5–8, fibulae; 9–11, belt hooks and belt chain; 12, razor; 13, knife; 14, shears; 15, socketed axe; 16, scythe; 17, grubbing hoe; 18, shaft-hole axe; 19, plow-share; 20, Sword Style design; 21, chariot rein-guide; 22, horse bits; 23–24, torcs; 25–26, bronze bracelets; 27–28, glass bracelets; 29–30, shield boss and wooden shield as known from preserved finds and stone sculpture; 31, helmet; 32–36, ceramic vases; 37, Hellenistic flagon (*50*). La Tène III (lower left): 38–39, sword and scabbard; 40, spearhead; 41–44, fibulae; 45–46, belt hooks; 47, lock key; 48, razor; 49, shears; 50, knife; 51, billhook; 52, scythe; 53–54, socketed and shaft-hole axes; 55, plowshare; 56, chariot rein-guide; 57, enameled knob; 58, rowel, for religious purposes; 59, horse bits; 60, mirror handle; 61, torc; 62, bracelet; 63–64, late British Insular Style design and stone sculpture (*56*); 65, helmet; 66, spur; 67–68, domed shield boss and shield as represented in stone sculpture; 69–72, 73–74 (*22*), ceramic vases; 75, Roman bronze jug imported into both La Tène and North European Lowland areas; 76, Roman wine amphora; 77, Roman bronze skillet; 78, Roman ceramic jug. North European Lowland IIIa (upper right): 1, sword, La Tène-made (?); 2, single-edged sword; 3–4, spearheads with shaft ferrule; 5–6, pins; 7–11, fibulae; 12–13, earrings; 14–18, 25–27, belt hooks and plates; 19, razor; 20, knife; 21, scissors (*28*); 22, sickle; 23–24, torcs; 28–29, bracelets; 30, domed shield boss; 31, loop-ring; 32–39, ceramic vessels. North European Lowland IIIb (lower right): 40–41, native-made sword and scabbard; 42, single-edged sword and chape; 43–44, spearheads; 45–48, pins, No. 47 of bone; 49–52, fibulae; 53, earring; 54–58, belt hooks; 59, razor; 60, knife; 61, scissors (*28*); 62, sickle; 63, socketed axe 64–65, torcs; 66–67, bracelets; 68, spur; 69, conical shield boss; 70–78, ceramic vessels. All N.E.L. artifacts are from closed grave finds.

mail is now in evidence) (Fig. 7; *17*), they are undoubtedly the times of greatest population and military power of the La Tène world. By migration, and the less clearly attested diffusion of cultural elements, La Tène Culture is carried north to the Harz, into eastern Europe as far as the Ukraine, and into the Balkans, Spain, and northern Italy. Greece is raided almost at will, and the ancestors of Saint Paul's "foolish Galatians" set up a Celtic-speaking kingdom around modern Ankara (Fig. 5), which began as a La Tène hill fort. Apparently an eminently successful ecological adjustment to the Sub-Atlantic climate in Central Europe, the La Tène Culture had adaptive potentialities even for different climatic zones.

While the extensive migrations, expeditions, and conquests of the La Tène Ib-Ic disrupted many of the old commercial patterns, the general effect within the La Tène Culture's area itself was to greatly reduce the regional diversification. The artwork becomes more stylistically uniform and the diverse elemental roots more profoundly integrated. During the La Tène Ic phase the art style carried to its ultimate extreme height an illusory tendency commenced during La Tène Ia, with designs in relief (the Plastic Style) rendered so as to be susceptible to two or three interpretations (Fig. 3, bottom left, 44, 53, 58).

While the average size of grains and pod fruits, such as beans, peas, and possibly lentils, remains smaller than that produced in the Mediterranean, there is manifested a marked but slow improvement in size over those crops produced in the Bronze Age (*18*). While sheep and pigs are common domestic animals and cattle seem relatively plentiful, the horses in the western Hallstatt–La Tène area remain so small that they are more frequently used for pulling chariots, even in warfare, than for riding (*19*). Experiments in domestication continued, for some plants now considered as weeds may have been cultivated, and in Champagne André Brisson discovered the burial of a red deer (*Cervus elaphus*) (*20*) which had been broken to the bridle. About 25 percent of the animal foodstuffs came from wild species as late as La Tène II, although by the time of the founding of the large towns (*oppida*) of La Tène III the amount of wild animal resources utilized dropped to nearly zero. At least by La Tène II times plows were equipped with iron shares (Fig. 4, left, 19, 55). By the last century before Christ, if not earlier, the La Tène Celts had invented a mechanical reaper (Fig. 8), which, when pushed through the field by a horse, stripped the heads from the grain. Two individuals equipped with long sticks kept stalks in position, serving the function of the reel in a modern mechanical reaper. This machine so fascinated the Romans that they sometimes depicted it in sculpture, providing the only archeological evidence of this predominantly wooden apparatus (*21*).

Late La Tène Iron Age Culture

Despite these obvious improvements in agriculture, the La Tène tradition begins a slow decline by 200 B.C., although the reason for this is scarcely understood. For one thing, however, blacksmiths, in their attempts to improve their metallurgical technique, actually diminish the quality of their weapons, for while the smiths could produce now an amazingly pure iron for tools and weapons by eliminating the carbon from the forge, they unwittingly abandoned the means by which they had been producing steel. The more southerly parts of the territory occupied by La Tène Culture were lost to the Romans. During the La Tène II phase (200–100 B.C.) weapons and other artifacts become very large (Fig. 4, upper left), and the major tactic seems to have shifted from thrusting to cutting, as shields now more consistently bear metal reinforcement for resisting the hewing attack, while helmets become more streamlined and lack the numerous protrusions of earlier models which could easily be engaged by swinging swords. Occasional chariot burials were still made, although by the next period spur finds indicate more extensive equestrianism (Fig. 4, left, 66).

The increased contact with the Romans contributed, probably along with other factors as yet undetected, to a rapid cultural and social change during La Tène III (100 B.C. to A.D. 1) (Fig. 4, lower left). Transformation of traditional culture proceeds so quickly that continuity with particular regional and tribal groups becomes difficult to trace. Apparently in Gaul as far north as the Marne and the Seine, and to a lesser extent in what is now southern Germany, a near mania developed for wine and other new Roman and Mediterranean items, and a continuous trade developed between urban Italy and the lately rural La Tène world. In its basic principles, the trade seems to have been carried on rather like that of Euro-americans with American Indians, with similar results for both parties—a breakup of the culture and society for the buyers of the foreign manufactured products and the political takeover by the society of the exporters of these products. This military-political conquest, known from history, proceeded from about 50 B.C. to the time of Augustus. In the preconquest days of La Tène III, fortified townlike trading centers developed (*22*), and through the natural but obscurant bias of Classical sources can be glimpsed the emergence of new social forces, obligarchies sympathetic to the Romans, destroying the traditional kings and aristocracy, and reducing the formerly apparently fiercely independent yeomen (say, of La Tène Ia) to the "miserable plebs" of Caesar's day. These changes are attested archeologically by the marked shift in the settlement pattern and the concomitant centralization of metallic, ceramic, glass, and other manufactures in the new towns, of which there are about one per tribe, although these latter are often united in hierarchially arranged supratribal confederacies, with one or more tribes dominant over the others. A more urbanely sophisticated burial rite replaces the old lavish inhumation graves with the dead bedecked in earthly finery. Now, rather simple cremations were put in wheel-made urns with a few grave goods, such as a safety pin, which perhaps constitutes less a grave offering than a purely functional shroud fastener.

The decline of the La Tène III world coincided with the climatic conditions in western Europe gradually becoming rather like they are now by the time of Christ, but any possible cause and effect relationships have scarcely been sought. At any rate, by the time of Christ most La Tène societies and populations had been incorporated into the Roman Empire, and the northerly and easterly remnants were rather quickly overrun by Germanic peoples with an Iron Age Culture of the North European Lowlands and by Sarmatians (and Slavs?) with a Eurasiatic steppe culture. Within six generations after the time of greatest material florescence, the La Tène culture, and Celtic peoples, had virtually disappeared from continental Europe, although the culture and the art style continued unabated among the free Celts of the British Isles (Fig. 4, left, 63, 64).

Early North European Lowland Iron Age Culture

The course of Iron Age cultural development of the North European Lowland (see map, Fig. 5) was almost inverse to that of the Hallstatt–La Tène tradition, although always in relation to it. The details of the prehistoric sequence in northern Holland, Germany, Poland and in Scandinavia are not so clear as in Central Europe, however, partly because research was stymied there until the richer Hallstatt–La Tène sequence was clarified (*23*), and the new chronologies have not been available long enough to enable extensive syntheses to have appeared, although some start is now being made (*24*). Consequently, I introduce here some slight adjustments, based on the revised Hallstatt–La Tène chronology, to the previous understanding of the Iron Age of the North European Lowland.

Unlike the situation in the south, the coming of iron and the nearly simultaneous onset of the Sub-Atlantic climate had almost catastrophic consequences. During the previous Northern Bronze Age, an extremely effective economy (for the time and place) had been developed by importing foreign metal into Scandinavia in exchange for amber and perhaps other products, and often many of the handsomely finished bronze manufactures were exported south again, apparently being eagerly sought after in Central Europe and other places. This trading system, so beneficial for the north, collapsed once iron began in earnest to replace bronze for edge tools, thereby wiping out the mainstay of the northern economy. Coupled with this shock came the increasing precipitation and cool weather of the Sub-Atlantic climate, described as a "climatic deterioration" for the north, where naturally the effects of cooling were more severe. Its being a lowland as well meant even greater flooding and a more pronounced growth of swamps and bogs than in the south. Therefore, the beginning of the Iron Age sees a great, long economic depression hit the northern area. The first ethnohistoric sources from Classical Rome report the north when just barely emerging from this depression, a circumstance which influences our view of north European culture history to this very day.

With the collapse of the Northern Bronze economy and ecological adjustment, there results a cutback in the wealth interred with burials, religious offerings, and in mercantile hoards. The knowledge of iron-working spread even more gradually into the North European Lowland than into central Europe, and indeed the 7th century B.C. is conventionally called phase VI of the Northern Bronze Culture (Fig. 1, upper right), although some iron objects—pins, jewelry, and some knives—are found. The latter are still more often of bronze, but the virtual absence of weapons from this period implies that rare and expensive iron ones were carefully husbanded. The few swords that are known are mostly bronze ones of the "Hallstatt I" type as in central Europe.

With iron's coming into prominence in Central Europe by the 6th century B.C., burials become even poorer by the first recognized period of iron-using

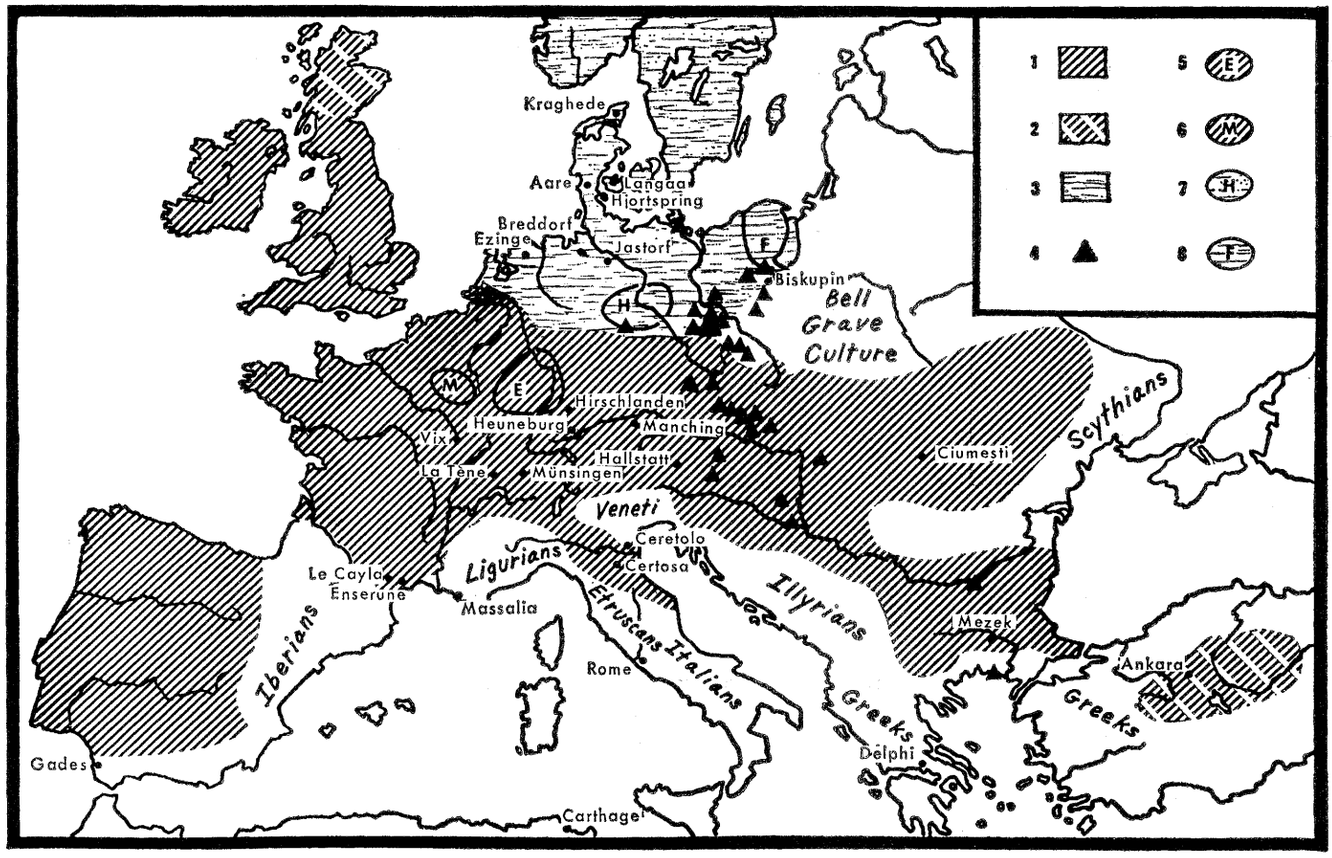

Fig. 5. Generalized map of Iron Age Europe, including some important archeological sites and historically known peoples and cities. 1, La Tène area at its greatest extent, about 300–200 B.C. 2, Modified versions of the La Tène culture. 3, North European Lowland area at about the same time. 4, Approximate westernmost limits of heavy steppe nomad assault, 6th to 5th centuries B.C. 5, Hunsrück-Eifel Culture. 6, Marne Culture. 7, House Urn Culture, about 500 B.C. 8, Face Urn Culture, about 500 B.C.

cultures of the North European Lowland (Fig. 1, lower right). Obviously it is a case of local peoples slowly adopting iron, as even from the beginning many regional cultures may be detected. The more southerly peoples of this area as well as the very closely related cultures of the seemingly proto-Baltic and proto-Slavic Lusation cultures are also hard hit by the Scythian-like attackers. The Lusation Culture of Poland virtually disappears as town after town—albeit well-fortified ones—are attacked and burned, and probably sacked, by horse-mounted archers from the south Russian steppe (*9, 25*). The Lusatian and North European Lowland Face Urn cultures seem to have been the ones which stopped the incursions from the steppe, although the former suffered so badly as to continue as the sparse Bell Grave Culture and perhaps as that east European settled peasant culture with Scythian-like utilitarian artifacts but lacking the horsemanship and wealth of the true nomadic steppe herders.

The Face Urn or Pomeranian Culture was not seriously affected by these invasions, however. In some ways it had a very similar counterpart, the House Urn Culture, in central Germany (Fig. 5). The former for over three centuries buried some of its cremated dead in urns with a human face and other features indicated on the outside of the cremation urn (Fig. 1, 26, 29, 65; Fig. 2, 35, 75; Fig. 3, 42 on the right). The Central European House Urn Culture buries occasionally in urns resembling ceramic house models (Fig. 1, 30, 64; Fig. 2, 27, 69 on the right). These funeral modes are partly inter-flowing, as one occasionally finds face urns with house-urn doors in the belly for intrusion of the deceased's ashes. To judge from the Face Urn area, this form of burial stressed the familial lineage in social organization, as here multiple cremations occur in stone cists; perhaps in the House Urn Culture, with similar burial patterns, the "house" somewhat more abstractly stood for the lineage, just as to this day in English the house, as in the "House of Usher" or the "House of Windsor," tends to merge conceptually with the lineage.

These face and house urns, if not these ideas, are shared with late protohistoric folk of Italy, including the presumed ancestors of Latin-speaking and Etruscan-speaking peoples. These Italian house urns date mostly before the 8th century B.C. (*2*), and therefore are contemporary with the Bronze Age ones in northern Europe, where these urns were made for a longer period of time.

Face urns, and more rarely the house urns, are found upon occasion to the west and north among other socio-cultural groups of the North European Lowland Culture. A regional culture around the mouth of the Elbe in Holstein and northern Hannover, the Jastorf Culture (*26*), is the best known, although it is not greatly different from the other neighboring ones in Scandinavia and the Frisian lowlands. The archeological finds, consisting primarily of cemeteries with many cremations buried in urns or in earth-dug pits, often with stone packing or covering, and sometimes under low mounds, contain few grave goods, mostly personal ornaments. Settlement sites are known mostly from Scandinavia and the northern Netherlands where the villages, aggregations of wattle and daub buildings, are normally without defensive features and usually inhabited for several centuries. In the Netherlands, the "terp dwellings" are built on artificial mounds which become higher and higher through the centuries, partly because of the dampness of the era but also because of the continuing subsidence of the land there. Fortifications seem rare outside the area in immediate danger of steppe nomad attack, and hardly any weapons are known, although the Pomeranian face urns do depict equestrian warriors with swords, spears, and shields (Fig. 1, right, 60, 65).

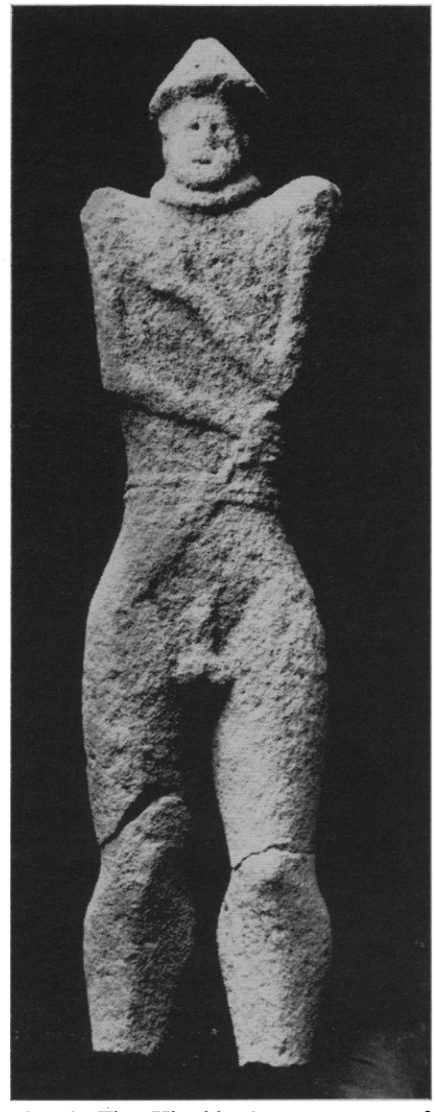

Fig. 6. The Hirschlanden statue carved from coarse Jurassic sandstone. The badly weathered figure now stands 1.5 meters tall, but when the feet, which were not found in the excavations, were present it must have been about 1.7 meters, which is about the average height of the male population of that phase of the Iron Age.

Despite the general poverty of finds from the 6th century B.C. some types are held in common with the Hallstatt II peoples, providing means of aligning the North European sequence with that of Central Europe (Fig. 1, lower right; Fig. 2, upper right). In the succeeding 5th century (Fig. 2, lower right), however, the sharing of types reaches an all-time low, and while the rapid transition from Hallstatt to La Tène takes place in Central Europe, with a bewilderingly abundant variety of artifacts produced, few of these are accepted in the north. Here, stylistic change is so slow that it is difficult to distinguish by form alone those finds which are contemporary with La Tène Ia from those contemporary with Hallstatt II. The striking independent-mindedness of the north cannot possibly be due to lack of contact, at least ultimately, with the La Tène world, as there one finds, by volume, nearly as much amber of northern origin as Mediterranean produce. Furthermore, the enormous quantities of amber imported by Mediterranean non–La Tène and Classical cultures must have passed from the north through La Tène hands. Probably this absence of impact by early La Tène modes in the north derives from the fact that the earliest La Tène styles, while basically appearing avant-garde to the North European Lowland, also had a slightly old-fashioned flavor in that certain motifs from the end of the Northern Bronze Culture were incor-

porated into La Tène art. What little of the early La Tène style interested the north, rapidly abandoning curvilinear styles, seems to be some of the simple rectilinear motifs out of the Hallstatt tradition.

Additional evidence of necessary southerly contacts also appears in the form of imported Mediterranean vessels at Langaa, on Danish Funen Island. One Italic import dates from early in the 5th century B.C., the other from the end of that century (Fig. 2, center, 87 and 84) (*27*). These unusual graves are from a cemetery which received rich burials until the La Tène III period. Seemingly, for about five centuries a line of well-to-do chiefs were buried here, where occur virtually the only known weapons from the 5th century B.C. Interestingly enough, one sees already the emergence of the first models of the drooping-pointed, single-edged weapon *cum* general purpose tool, the scramasax (Fig. 2, right, 36) which a millennium later in the hands of Germanic yeomen of the carl class was to be the most common weapon in the epoch of the Great Migrations. While La Tène and other Iron Age peoples sometimes carried a straight-backed, one-edged weapon (Fig. 2, left, 45), the characteristic form of the scramasax remains one of the most reliable diagnostic artifacts connected with Germanic peoples of the protohistoric and ethnohistoric horizons.

In the grave at Langaa are found a broken specimen of a very early pair of hinged scissors (Fig. 2, right, 64), the complete version of which is known from a later grave at Kraghede (Fig. 4, right, 21) in northern Jutland (*28*). By chance, it happens that some artifacts made of organic material, some dresses, a comb (Fig. 2, right, 65), and a wooden bucket also have been preserved from 5th century B.C. Denmark.

Other cemeteries of this time in north Germany, as at Breddorf, near Bremen, appear also to be family cemeteries where members were buried over a period of several centuries, with only a few graves of each phase being represented (*29*). The settlement type would appear to be the *einzelhof*. While at Langaa there may be a cemetery of this sort, at least on Jutland the villages and cemeteries, as at Aare, near Ribe (*30*), must belong to multifamily settlements.

During the Iron Age of the North European Lowland, as in the La Tène Culture, wild food resources constituted an important part of the diet. The analysis of plant remains indicates that while barley was perhaps the most important crop, about 33 percent of vegetable foodstuffs was provided by varieties now considered as weeds (*31*), although it seems highly likely that some species, such as goosefoot (*Chenopodium album*), may actually have been cultivated then. Notably, the weeds utilized systematically in quantity are those which take hold first on fallow fields, meaning that already the so-called medieval three-fold system, a primitive version of crop rotation, was practiced. The fallow field did not merely regain fertility, however, but also furnished a dietary supplement relied upon as late as the first centuries of A.D. times, when the climate had returned to a condition about like that of today.

By the northern phases synchronous (Fig. 3, right) with the expansive Ib and Ic phases of La Tène, one can detect a somewhat greater number of influences from the La Tène Culture, including a few finds of fibulae, torcs, and other objects, including an outstanding La Tène-made cauldron from Brå, Denmark (Fig. 3, left, 53). Since southern interest in amber had declined by this time and the old Mediterranean trade was somewhat disrupted, the increased contacts must have come partly from the more northerly push on the La Tène Culture, and the newer contact, while more influential, may have been more hostile than before.

However that may be, weapon finds are very rare (*32*). Virtually the only ones known are from Hjortspring in Denmark, recently dated to Jastorf c, which equals La Tène Ib in the new chronology, just as the subsequent early Ripdorf, as originally conceived, equals

Fig. 7. Ciumesti iron helmet surmounted with a bronze heraldic falcon. The grave, dated to La Tène Ic, included a spearhead with a coat of chain-mail.

La Tène Ic, as the numerous Ic fibulae included in that Ripdorf phase testify (*33*). The Hjortspring weapons, found with a wooden war canoe, shields (Fig. 4, right, 1–7, 32, 43), and wooden vessels, are all one-edged scramasaxes and spears, some made of imported iron. At Hjortspring was also a coat of ringmail (*34*), the invention of which is attributed by Classical authors to the Celts, who at any rate could have been the ones who introduced this type of armor to the Mediterranean.

A similar hoard found at Krogsbølle, Funen, which both Klindt-Jensen and Becker agree can be dated a little later, hence to Ic times, contains similar but more advanced types of one-edged weapons and spears, and includes a true sword, seemingly of La Tène manufacture (Fig. 3, lower right). These Krogsbølle weapons may have been found at a battle site, as some lay upon an ancient cobblestone-paved roadway, therefore dating it back to this time.

Similar roads have been found at the fortified village at Borremose, in northern Jutland (*35*). Other fortified villages are known on Jutland from the third century B.C., implying more interior unrest within the northern lowlands than within the La Tène world itself, although some La Tène forts are also found along the contact zone in central Germany.

By La Tène II times certainly both native North European Lowland weapon finds and evidence of the interchange of ideas with the La Tène world are greatly multiplied (Fig. 4, upper right); so is the total number of finds in the north, indicating that as the climate slowly became more favorable and the iron technology was mastered, there was a concomitant increase in population. Many of the old family cemeteries, as at Cammer (*36*) (in the old House Urn region), contain so many more burials of the later than the earlier phases that the former *einzelhof* must have become the nucleus for a village or clan settlement, or both. Social stratification within society must nevertheless have been little developed, with only a few places like Kraghede or Langaa revealing any evidence of chiefly burials.

Socio-economic discrepancy in dwelling type is notably lacking (*37*), suggesting that even such chiefs were here too merely "first among equals," and east-European prehistorians normally infer for the tribes of these phases the kind of "warrior democracies" described by Tacitus for somewhat later times. A few vehicular burials are known from the north, and while one certainly dates from this time, unfortunately the others are less clear as to age (*38*).

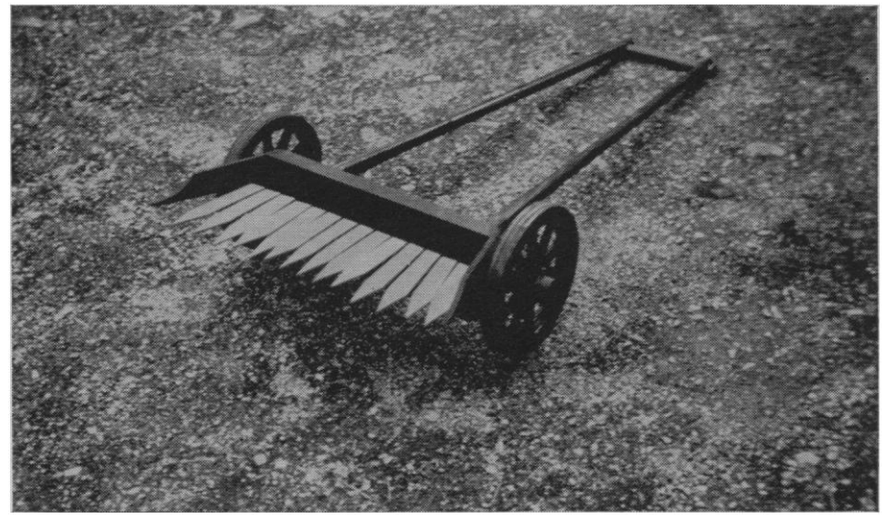

Fig. 8. Model of a late La Tène mechanical reaper reconstructed on the basis of early Roman period bas-reliefs and descriptions. A horse harnessed between the two shafts pushed the reaper forward. This model is in the Musée de la Princerie, Verdun (Meuse), France.

Although possibly most of the swords are of La Tène origin, some locally made ones appear, carried slung at an angle for quick-draw readiness (Fig. 4, right, 40). Certainly by the phase contemporary with La Tène III locally made North European Lowland swords have gained a distinctive form, with such features as the large pommel, trapezoidal handle, and faceted blade which were to persist for over half a millenium in the Germanic sword-smithing tradition. The scramasax continued in actuality to be the most common close-combat weapon.

By now, the people of the North European Lowland had definitely entered into a period of expansion to the south and east, encroaching upon the former territory of the La Tène people, who were also having troubles with the Romans and new invasions of steppe nomads. The historically known Cimbri and Teutones are early examples of this movement from the north into the La Tène territories. With the constantly intensified contact with the La Tène world and the switchover to cremation by nearly all the La Tène cultures, it becomes increasingly difficult to distinguish between the two traditions (Fig. 4, lower right). The local manufacture of objects in the La Tène curvilinear art style, which began slowly in La Tène II in the north, becomes more pervasive in the last century before Christ, and while the northern substyle remains distinctive, there are probably more art objects decorated in the La Tène style, broadly conceived, made in the north than in the continental La Tène world itself during this last century. There may be some likelihood to the suggestion that many La Tène craftsmen, unable to work in the progressively more disrupted La Tène milieu, where the tastes were becoming increasingly oriented toward Roman modes, actually sought refuge among the chiefs and villages of the North European Lowland (*39*). Certainly by the time of the Roman conquest of Central Europe, most other formerly Celtic territory was occupied by Germanic-speaking peoples with a culture of the North European Lowland tradition by now deeply pervaded by La Tène elements. These peoples and the archeologically more elusive Slavs became the heirs and the perpetrators of the iron or steel technology ecologically adapted to the temperate woodland zone of Europe north of the Alps, creating, in these traditions, the material culture which eventually was used to dismantle the Roman Empire and rebuild much of European culture and society.

Summary

During the first half of the last millenium B.C. the knowledge of effective ironworking techniques was gradually

acquired by Europeans north of the Alps. The Hallstatt period of central and western Europe was a time of experimentation, necessitated both by the arrival of the new technology and a fairly marked change in climate. By the beginning of the La Tène period, skilled craftsmen had developed a basic tool inventory suitable for iron and utilizable in a temperate woodland environment, a general cultural stimulus being an apparent concomitant. The La Tène people for centuries were eminently successful in producing a number of cultural innovations as well as greatly expanding their territory of occupation.

Within less than a century, however, the La Tène Culture became disoriented and disrupted. While the reasons for this are scarcely understood, this collapse occurred when several neighboring peoples embarked upon expansive enterprises just as many La Tène tribes were undergoing a social reorganization.

Many La Tène elements survived even though the culture itself virtually disappeared on the continent, because by about 100 B.C. much of La Tène origin had been adopted by the North European Lowland Iron Age cultures. These northern cultures also retained their own innovations, developed after an extensive and painful ecological readjustment during their early Iron Age. As a consequence of this syncretism, when in later historic times Germani and Slavs largely broke down the Roman Empire and instigated a new socio-cultural reorganization of Europe, elements of both the La Tène and more northerly traditions were injected into the basis of Western Civilization.

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