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Inquiry into the significance of iron technology in early Iron Age Palestine

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AN INQUIRY INTO THE SIGNIFICANCE OF IRON TECHNOLOGY IN EARLY IRON AGE PALESTINE

By

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An Inquiry into the Significance of Iron Technology in Early Iron Age Palestine

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This study reviews the impact of iron technology on the culture and history of Early Iron Age Palestine. Because archaeological and literary evidence are scarce, information obtained from art, from the study of symbols, and from several sub-disciplines of anthropology, ritual studies and comparative ethnography, are applied. Several questions are addressed: 1) the introduction of ironworking into the Near East; 2) the so-called "monopoly" on ironworking by the Philistines; 3) how the introduction of iron technology affected the relationships among the Israelites, the Canaanites, and the Philistines; and finally, how the understanding of iron technology affected Israel's understanding of her history when that history was recorded.

Conclusions drawn from the study are: 1) past assumptions based on 1 Sam. 13:19-23 about a Philistine monopoly must be re-evaluated; and 2) iron technology as it was understood after the 10th century B.C.E. was applied symbolically in the Israelite literature to explain past experiences in which iron did not play a dominant role.

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PALESTINIAN CHRONOLOGY*

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* (Lapp, 1975:48-49).

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ABBREVIATIONS

AASOR	Annual of the American Schools of Oriental Research
AJA	American Journal of Archaeology
AnSt	Anatolian Studies
BA	Biblical Archaeologist
BAR	Biblical Archaeology Review
BASOR	Bulletin of the American Schools of Oriental Research
IEJ	Israel Exploration Journal
JAAR	Journal of the American Academy of Religion
JNES	Journal of Near Eastern Studies
PEF	Palestine Exploration Fund
PEFAn	Palestine Exploration Fund Annual
PEQ	Palestine Exploration Quarterly
QDAP	Quarterly of the Department of Antiquities in Palestine

CHAPTER I

BACKGROUND TO IRON TECHNOLOGY IN THE ANCIENT NEAR EAST

Introduction

For years archaeologists and historians have noted the shift that occurred in Early Iron Age metal technology in the ancient Near East. Only recently has research described the interrelationships between this change and the economic, political, social, and religious spheres of life in the ancient Near East (Waldbaum, 1978; Wertime and Muhly, 1980). The importance of metal technology has also been noted in recent historical, sociological, archaeological, and anthropological works such as Trude Dothan's The Philistines and Their Material Culture (1982) and Norman Gottwald's The Tribes of Yahweh (1979).

> The study of the scientific background to the study of metallurgy adds an objective dimension to the reconstruction of ancient systems--a tangible reflection of human desires and ways of life. (Wheeler and Maddin, 1980:125)

Scholars have recognized the development of metallurgy in the ancient Near East as a crucial factor in the process of early urbanization and the rise of civilization. Metallurgy accompanied and was stimulated by developments such as

writing, mathematics, and the calendar. Its impact has been compared to other sciences that contributed to the rapid evolution of civilization and centralized state. The use of metals contributed significantly to the technological and economic character of early urban life, but metal's impact was also felt in the political, social, and religious spheres of culture. One of many interacting elements in urban culture, the acceptance and use of metals was also determined by a combination of social, economic, technological, political, and religious factors and by the ecology of the ancient Near East.

A full understanding of early iron technology and of the advent of the Iron Age must include knowledge of all aspects of culture and their interrelationships. Theodore A. Wertime has noted:

> What stands out in the story of the complexities of the advent of iron...(is) the interconnectedness of and massiveness of the thrust toward a literate, trading and communicating, roadbuilding and seafaring, urban, pyrotechnologic civilization emerging in the fertile crescent and Eastern Mediterranean. (1980:9)

The following survey of the archaeological and textual evidence for the use of iron before the Iron Age spans a time period from the fourth millennium B.C.E. down to ca. 1200 B.C.E. Areas related to Palestine through cultural connections or trade, i.e., Anatolia, Iran, Mesopotamia, Egypt, and Syro-Palestine are surveyed. To facilitate comparisons, lists of artifacts and their origins have been summarized in the tables at the end of the thesis.

The Background of Iron in the Near East ca. 4000 B.C.E. to 1200 B.C.E.

The Bronze Age in the Near East was characterized by increased urbanization, the formation of empires, and the development of writing systems. Civilizations depended on bronze for the manufacture of tools, weapons, vessels, and other items including jewelry and ornamental objects. Archaeological and textual studies have provided evidence that iron was also recognized and used as early as 4000 B.C.E. Iron was, however, used much less than bronze.

The Archaeological Evidence

Iron metalcraft in the Near East predates the third millennium B.C.E. Although the archaeological evidence is scarce, a few examples from this period can be cited. Fourteen iron objects from four sites dating to this period have been discovered. One is in Iran, one in Mesopotamia, and two in Egypt (Waldbaum, 1980:69-80) (Table 1).

During the third millennium B.C.E. the use of iron appears to have increased. Archaeological sites yielding iron artifacts from this period are in Mesopotamia, Anatolia, and Egypt, with the greatest concentration of iron in Mesopotamia. The twenty-four objects found represent a variety of forms, primarily ornamental, and most were found in contexts that suggest ritual or ceremonial function such as tombs, temples, and graves. Sometimes the iron objects contain a second, precious metal such as gold (Table 2).

Evidence for the use of iron in the Middle Bronze Age (ca. 2000-1600 B.C.E.) is scarce. Only five objects are known from this period, four from Anatolia and one from Egypt (Table 3).

By the Late Bronze Age iron was used in increased quantities and distributed over a wider geographical area. A greater variety of types and functions occur, but jewelry, ceremonial weapons, and ornamental objects remain dominant. Iron is again combined with other precious metals. There is evidence of occasional utilitarian use, but such use seems limited when compared to that of non-utilitarian objects. The contexts of iron objects from this period are still most often royal or wealthy tombs, palaces, and sanctuaries. A total of fifty-two objects come from sites in Mesopotamia, Egypt, Anatolia, and, for the first time, Syro-Palestine (Table 4).

The archaeological evidence indicates that iron was initially used for decoration in the Near East. From the first appearance of man-made iron objects down to the end of the Late Bronze Age the largest percentage of iron objects were ornamental. They often combined iron with other luxury materials. Iron jewelry, some pieces containing gold, ceremonial daggers and battle axes with elaborate handles, amulets, and funerary apparatus were the predominant types. The types of these objects and their contexts, i.e., primarily graves, tombs, treasure hoards, palaces, temples, and

sanctuaries, indicate that iron was used irregularly and was treated as a precious material, evidently limited to use by kings and other prominant people. The evidence also suggests that iron was rare and difficult to work. Indeed, even those finds that do not appear to be ornamental, i.e., tools and weapons, can be assumed to have served ceremonial rather than utilitarian function because of the nature and contexts of the artifacts.

The degree to which meteoric iron was used before the Iron Age is noteworthy. Meteoric can be distinguished from terrestrial iron by its nickel content. Of the artifacts tested, many have been proven to be meteoric (Waldbaum, 1980: 69-70), but the use of smelted terrestrial iron predating the third millennium B.C.E. is also attested very early by an object found in a grave at Samarra in Northern Iraq. By the late Bronze Age smelted terrestrial iron was more widely used. However, the extent to which meteoric iron was used in manufacturing indicates that it continued to be predominant over terrestrial iron during the Bronze Age. Even though an axe-blade from the Late Bronze Age sanctuary at Ugarit (ca. 1450-1350 B.C.E.) proved upon testing to have a significant carbon content, carburization is not considered to have been practiced intentionally until a few hundred years later.

Textual Evidence[1]

A number of ancient Near Eastern texts refer to iron. They are an important source for reconstructing the earliest stages in the manufacture and use of iron. Most of the texts date from the second millennium B.C.E. but probably reflect an earlier understanding of the nature of iron (Bjorkman, 1973:91).

Because archaeological reports on Middle Bronze Age sites record few iron finds and because the iron objects found are poorly preserved, the contemporary literary documentation is particularly valuable (Waldbaum, 1980:75).

Middle Bronze Age texts that mention iron include the Cappadocian texts of the Old Assyrian trading colony of Kültepe in central Anatolia (ca. 1900-1800 B.C.E.), the Hittite Annita texts from approximately the same time, an Old Kingdom Ritual text, the Alalakh texts (18th century B.C.E.), the Mari texts (ca. 1700 B.C.E.), and the Susa texts (18th century B.C.E.).

The Old Assyrian texts provide some indication of the role of metals in society and of the relative values of the metals in use (Muhly, 1980:36). Two terms are used for iron in these texts, Akkadian amūtum and aš̌i'um. The distinction between them is not known, but it has been conjectured that the former may be the term for meteoric iron and the latter for terrestrial iron (Muhly, 1980:35). The texts indicate that iron was expensive, eight times more expensive than gold

(Waldbaum, 1980:75), and 400 times the value of tin, even though iron was local and tin imported (Muhly, 1980:35). Iron was so precious, in fact, that there was an interdiction against its being taken from the country. Muhly believes that the value of iron can only be explained by supply and demand and by the rarity of the metal whose methods of production were not really understood (1980:36).

The Hittite term ANBAR GE nepišiš, literally "black iron from heaven" (Maxwell-Hyslop, 1972:162), is used in the Anitta texts to describe a throne and possibly a sceptre (Waldbaum, 1980:75, 79). ANBAR is also the Sumerian term for iron but it seems to lack the celestial connotations of the Hittite word. We cannot determine from the content of the Hittite text, however, whether the throne was made only of iron. An iron throne is referred to in an Old Kingdom Ritual text from Egypt (Waldbaum, 1980:75) where the Egyptian term for iron, bia' n pet, also seems to reflect a cosmic origin, although it is used in association with all iron.

An Alalakh text, also Hittite, refers to 400 weapons of iron (ANBAR). Waldbaum states that the weapons (ŠUKUR) referred to are possibly spears (1980:75), while Wertime labels them arrowheads (1964:1262). The reference has often been cited to support the claim that the Hittites had a monopoly on iron. The material record has not supported this claim.

The Mari texts speak of the precious nature of iron and its use as an item of trade (Waldbaum, 1980:75). One of the

texts mentions an iron bracelet sent to Mari by the king of Carchemish; a single item of jewelry worthy of being traded among kings, together with other expensive objects. This text is the first mention of iron as an item of trade. Iron is also portrayed as a luxury item that was not readily available and was more costly than gold. An 18th century Susa text which mentions iron and gold rings is the last on our list from the Middle Bronze Age.

From the Late Bronze Age there are more texts dealing with iron use and trade than with its manufacture. Most of them are Hittite, but some are from Assyria, North Syria, and Egypt (Waldbaum, 1980:80). The texts come from Susa, Mari, Alalakh, Quatna, El Amarna, Mitanni, Ugarit, and Nuzi. Many of them refer to iron jewelry and ceremonial weapons, and to the exchange of small iron objects among monarchs, or to the use and storage of ceremonial objects in palaces and temples.

One of the Amarna letters, a letter from the Hittite king Hattusilis III (ca. 1250 B.C.E.) probably to Shalmanesar I of Assyria is the only text alluding to the manufacture of iron (Waldbaum, 1980:80). The letter is apparently an attempt to put off Shalmanesar's demand for a shipment of iron and to appease him with a gift of an iron-bladed dagger. It explains that the time was not good for producing iron. In addition to indicating that iron manufacture was a slow and unreliable process, the letter speaks of iron manufactured within the

boundaries of the Hittite empire, stored in Kizzuwatna, and exported to other monarchs (Waldbaum, 1978:21). This letter has been used along with the Alalakh text mentioned above to support the claim that Hittites monopolized iron, an assertion which is not supported by the archaeological evidence.

A text from Nuzi refers to a coat of iron scale armor for a horse (Muhly, 1980:50). Iron also appears in the temple inventories of Qatna in Northern Syria (Waldbaum, 1980:80), and frequently in Hittite inventories and rituals.[2] The cultic use of iron is emphasized in the ritual texts. Iron is listed with other metals, "possibly indicating that the participants (in the rituals) wanted to use or invoke something of every such material known to them" (Waldbaum, 1980:81). Bjorkman cites one Hittite ritual text that includes iron (1973:110). It is a ritual for erecting a house:

> The diorite they brought from the earth. The black iron of heaven they brought from heaven. Copper (and) bronze they brought from Mt. Taggata in Alasiya....

Many of the early textual references to iron cited seem to indicate that meteoric iron was the primary source of the metal. The terms used suggest a meteoric source and indicate that the peoples of the ancient Near East were aware of its celestial or extraterrestrial origins. There are a number of texts that refer directly to meteors and meteorites. Most of these texts are of a type known as celestial omens (Bjorkman, 1973:92). Two of the oldest (not later than 1200 B.C.E.) are

written in Hittite but represent copies of even older Akkadian originals (Bjorkman, 1973:91). The omens are frequently indicated by either "falling" or "flashing" stars. In Mesopotamia, the "falling" stars seem to have been considered bad omens and "flashing" stars good and bad portent. For example, one text states:

> If a shooting star flashes (as bright) as a light or as a torch from east to west and disappears (on the horizon) the army of the enemy will be slain in its onslaught. (Bjorkman, 1973:92)

The basic theme running through these texts is of gods speaking to mankind through shooting stars and meteors. There is better textual evidence for iron meteorites than for stony meteorites. The Hittite term for iron, ANBAR, literally means "black iron," which seems to be a technical term for meteoric iron (Bjorkman, 1973:110). The word "black," states Bjorkman, probably indicates the black fusion crust that covers meteors.

To summarize, the combined textual and archaeological evidence predating the Iron Age strongly suggests that iron was rare and precious. The desire to possess iron, as indicated clearly in the Hittite letter from Hattusilis to Shalmanesar, was not for a strong and technologically superior metal. Rather, it was a desire for a metal with great symbolic significance, whether it be in the realm of prestige, wealth, magic, ritual, or ceremonial use. Iron was

buried with the dead, stored with other treasures in palaces, and used (or stored?) in temples. It was a metal of cosmic origin and its cosmic form (meteors) was consulted in times of emergency. Iron was also traded on a small scale, but only in the succeeding millennium did it surpass bronze in the manufacture of utilitarian objects. Iron's usefulness as a utilitarian metal was dependent upon, and was the result of, the discovery of a new technological process in its manufacture. This discovery, the process of carburization, was evidently first made and recognized sometime between 1200 and 1000 B.C.E., and ushered in a new age of metal technology.

The Early Iron Age in Palestine

The Late Bronze Age in the Near East was a time of prosperity and extensive international trade. However, the historical and archaeological records testify that toward the end of the period, the civilizations of the ancient Near East experienced significant disturbance which led to disruption in trading patterns, redistribution of power, and a general decline in material culture. Migrations, dislocations, and movements of diverse population groups are referred to in Late Bronze Age texts and inscriptions from Ugarit, Alalakh, and Egypt. Mass destruction of Late Bronze Age cities and towns is documented by the archaeological record. The chaos was due in part to the movement of the

Sea Peoples that resulted in the political realignments and the beginning of a new occupational phase (Stech-Wheeler et al., 1981:245). Even historical records from the region are temporarily deficient during this period.

The advent of the Iron Age was coincidental with or subsequent to these shifts. The introduction of iron, specifically "steeled" or carburized iron, and the diminishing use of bronze in most regions of the Near East coincided with this period of severe recession.[3] Although iron was increasingly employed for the manufacture of utilitarian implements from the 12th century B.C.E. forward, 1200-1000 B.C.E. was a transitional period during which iron eventually replaced bronze as the predominant working metal. The political fragmentation eventually provided a climate in which more local industries could be developed and local raw materials exploited. Ironworking was one of the industries and the increased use of iron has been generally recognized as the most important technological change in the new period. The gradual ascendency of iron can be traced in the archaeological record through the partial conversion of tools and weapons from bronze to iron until a time when iron implements equalled or surpassed their bronze counterparts.[4] The change reflected important economic developments but did not necessarily cause them (Snodgrass, 1980:337).

A number of theories have been proposed to explain the change from a predominantly bronze technology to iron. In

1956 H. H. Coghlan noted that the discovery of iron

> opened up an entirely new field in that it led to the availability of a vast quantity of relatively cheap metal which was of a nature much more suitable to the manufacture of tools and weapons than the non-ferrous alloys could be. Also iron is, of course, well suited to a wide range of domestic and general use. (13)

Questions asked today concerning the introduction of ironworking are whether this "discovery" in itself was sufficient to stimulate the practice of a new technology. Scholars agree that the discovery of iron was an important factor in the rise of iron technology, but many do not feel ironworking was necessarily the prime mover. The origin of ironworking also raises questions. How was it introduced in the Near East and from where? Was the technology developed locally, or was it introduced from abroad?

The notion that ironworking was introduced by the Hittites (e.g., Wright, 1938:5) has now been largely rejected, although some (e.g., Stech-Wheeler et al., 1981:264; Wertime, 1973:885) still assert the possibility that ideas originating in Anatolia "may have played a crucial role in stimulating the desire to produce iron in other areas" (Stech-Wheeler et al., 1981:264). The Philistines have also been designated as the peoples who introduced ironworking into the Near East, especially into Palestine.

> It would seem that the Philistines had learned to use iron in the north (Anatolia), were holding a "corner" on the iron market in Palestine, and

> were closely guarding the trade secrets of its production. (Wright, 1938:6)

Scholars who hold a Philistine introduction, suggest that iron technology was originally developed in the Eastern Mediterranean, with Greece and Cyprus playing major roles, and that it was subsequently introduced into the Near East through the migration of the Philistines and other Sea Peoples who had had contact with these centers (Snodgrass, 1980:356; Muhly, 1982:48).[5] Trude Dothan, on the other hand, states that

> the assumption that the Philistines introduced iron production into Canaan, which was generally accepted in the past, can now be refuted by the widespread dispersal of iron technology throughout the Eastern Mediterranean. (1982:91)

The answer is by no means clear. Because textual documentation is lacking, the task of clarifying the answer necessarily falls upon archaeologists and upon historians who rely upon their findings.

Lack of or decreased access to tin, a necessary raw material in the manufacture of bronze, is the most recent and most widely accepted explanation for the increased use of iron in the ancient world.

> Since bronze had been satisfactory...for several thousand years and iron did not appear to be useful, it must be inferred that iron was not suddenly adopted as a result of technical innovation, but rather that bronze became scarce. The further inferrence is that the scarcity resulted from an interruption in the supply of tin and even of copper

> to the bronze smelters of the eastern Mediterranean. (Maddin et al., 1977:122)

A shortage of tin and/or copper, probably caused by the disruption of trade in the Late Bronze Age, made it impossible to go on producing bronze (Muhly, 1980:47). New resources needed to be developed and because almost every country had some local deposits of iron ore, iron could have been utilized at a lower cost than bronze, which was growing scarce.

Some scholars agree with the above stated theory but reject the idea that a shortage of tin was a factor operating outside of Cyprus and the Aegean (e.g. Snodgrass, 1980:367). Their conclusion is based on the fact that the development of ironworking in Palestine began at approximately the same time as in Cyprus and Greece, but thereafter Palestine progressed more slowly toward an iron-based economy. The implication is that Palestine did not suffer the same constraints in acquiring copper and tin.

Where the tin used in the manufacture of bronze came from is also an interesting and unsolved problem.[6] Some form of long distance trade must be assumed because there are no known sources of tin in the Aegean, eastern Mediterranean, or Near East, except for deposits in Egypt which appear to have been unexploited (Muhly, 1980:31). Thailand and Cornwell, England have been suggested as possible sources. However, their distance from the Near East makes this

unlikely. The Mari texts contain references to the trade of copper and tin but they are vague about the ultimate source of tin (Muhly, 1980:31).

Regardless of the historical factors involved, it is fairly safe to assume that technological factors played a crucial role in determining the development and increase in iron. Anthony Snodgrass (1980) has postulated a three-stage process for the development of ironworking in antiquity. The basic criterion for identifying his stages is the presence of "working iron," i.e. iron used to make the functional parts of "real" implements that form the basis of early technology. In stage 1 of this scheme iron began to be used, but was not employed as "real" working iron. The inventory of iron objects from this stage consists primarily of ornamental objects and objects that have the form of real weapons or tools, but whose contexts suggest no practical function. Stage 2 was a transitional stage in which working iron was present but not predominant. In stage 3 iron became the predominant material used in the manufacture of utilitarian, functional implements. The transition from stage 1 to stage 2, Snodgrass states, reflects a technological change, and from stage 2 to stage 3 an economic one.

> To understand the spread of early ironworking one must distinguish between the essentially technological factors, such as those that brought about the initiation of our stage 1 and the transition to stage 2 and the essentially economic factors

> that must lie behind the change from stage 2 to stage 3. The conditions which generated the former may have been unconnected with the latter. (Snodgrass, 1980:368)

Technologically, iron only became a medium superior to bronze for manufacturing utilitarian tools and weapons when it was carburized. Uncarburized iron would have been an unacceptable substitute for bronze because it is not as strong. Because the technology of working iron is more complex than anything connected with copper or bronze and carburization is not a process that affects copper or copper alloys, no direct transfer from copper technology to iron technology could have taken place (Wheeler and Maddin, 1980: 124).

Essential to the development of Snodgrass' stage 1 and stage 2 were the following technical achievements: (a) the correct slagging of ore to remove impurities; this involved the selection of a proper flux, a task which entailed a good deal of skill and experience; (b) since iron could not be heated to its melting point (1530 degrees) in antiquity the bloom (the first product of smelting) had to be reheated and rehammered to get rid of the enclosed slag and cinders, and to consolidate the mass of iron globules, and tools had to be developed to handle these large heavy masses of bloom; (c) the technique of carburizing and quenching had to be mastered, which meant that the iron had to be in contact with charcoal (carburized) and forged, and then reheated and

reforged, followed by quenching (cooling quickly after carburizing at high temperatures).

The crucial technological achievement was carburization. When iron is heated in intimate contact with charcoal for a prolonged period of time, carbon is absorbed by the iron to make it a much harder substance. The amount of carbon absorbed depends on the length of time the object is left in the fire and on the fire's temperature, which must be below iron's melting point but above 900 degrees c. The discovery of carburization was probably accidental but, although the ancient smith surely did not realize that it was the absorbtion of carbon that transformed the iron, awareness that some iron tools were better than others must have encouraged continued experimentation. Consequently, the process was eventually well enough controlled to develop properties in the metal appropriate to the function intended for the object being made (Maddin et al., 1977:126).

Evidence of actual iron mining and manufacture of iron implements is scarce and difficult to interpret. Ancient mining operations are especially difficult to identify and date because continuous mining in a single area eliminates traces of previous activities.

Although the Old Testament describes Palestine as "a land whose rocks are iron" (Deut. 8:9), this may be an exageration. In 1935, when Nelson Glueck published the

results of his extensive survey in eastern Palestine, he identified numerous centers of copper mining and smelting operations[7] dating from the Early Iron Age and several deposits of iron ore. "Numerous veins" of iron ore were found in the vicinity of the Wadi eṣ-Ṣabrah south of Petra (Glueck, 1935:49, 80; Menashe, 1977:76) and large heaps of iron slag were noted near the town of Ajlun north of the Jabbock River (Menashe, 1977:76). Today, as a result of surveys since Glueck's, the Ajlun hills are recognized as containing one of the major deposits of iron ore in Palestine (Stech-Wheeler et al., 1981:259). Other potential sources have been identified as well: at Makhtesh southwest of the Dead Sea, in Galilee, along the Wadi ᶜArabah, and small deposits in Jordan and Lebanon (Stech-Wheeler et al., 1981:259; Waldbaum, 1978:59; Menashe, 1977:76). James Muhly, noting that archaeologists have found a number of early copper mines but no ancient iron mines, has suggested that this may be because the latter were surface mines (1982:44). Iron ore deposits, he states, tend to be on the surface so their extraction does not require any elaborate mining technology. Mining iron would have been easier than mining bronze.

Copperworking is attested at several Palestinian sites in the 11th century, and a Philistine copper or bronze industry is attested by the association of Philistine remains

with copper or bronzeworking installations (Waldbaum, 1978: 61). But, again, little or no evidence exists for iron working installations. One possible ironworking area has been identified at the Canaanite site of Ta^{c}anach (Stech-Wheeler et al., 1981). An area of what has been identified as a cultic building contained a number of iron artifacts, the nature of which suggested the presence of a work-area for some kind of metallurgic activities. It has been suggested that the room was either part of a smith's working area, probably where repairs were made, or a storage area (Stech-Wheeler et al., 1981:249).

Another possible ironworking installation has been uncovered recently at the site of Tel Yin^{c}am in the lower Galilee (Liebowitz, 1981). A Late Bronze Age building that may have originally been built as a palace or temple was subsequently reused in a secondary phase as an industrial installation (81). The structure has been identified by the excavators as "the only ancient Palestinian iron smelter known to date" (79). A 1.40 meter accumulation of industrial debris, Liebowitz says,

> suggests that the structure served an industrial function, at least in its final phase. The debris consists of poorly preserved remains of small, semi-circular smelting furnaces, slag consisting of 8-9% iron oxide, phytoliths (plant remains of consumed fuel), chunks of high quality red ochre, and brittle, frequently ochre-smeared pottery. (82)

The presence of iron oxide and the absence of copper in the slag, the presence of ochre-smeared, refired vessels, chunks of iron ore (high quality ochre), furnaces, and gradations in the coloring of material (probably resulting from reduced atmosphere) are cited to support identifying the installation as a primitive iron smelter.

Liebowitz claims that the find contributes to the resolution of three problems. (1) It is evidence of the continuity of iron-smelting in the Late Bronze Age. (2) As the only, or one of the two,[8] known ancient smelters in the Near East, it provides insights into the primitive, probably not all too successful, ironworking technology of the Late Bronze Age. And (3) it supports the view that ironworking was gradually developing prior to the appearance of the Philistines who never penetrated the Yarneel Valley where Tel Yin^{c}am is located. He states that

> there is no cogent reason either to attribute the Philistine military superiority to their so-called iron monopoly, or to credit the Philistines with the introduction of iron into Palestine. Ironworking operations were carried out at Tel Yin^{c}am prior to the coming of the Philistines to the shores of Palestine. (Liebowitz, 1981:84)

Others reject this interpretation, claiming that although there is certainly evidence of some pyrotechnological activity, the absence of any trace of metal and substantial quantities of slag does not support it (e.g. Stech-Wheeler et al., 1981:261).

As is obvious in the above discussion, it is impossible to make sound conclusions about mining and manufacturing activities in ancient Palestine. More extensive surveys and excavations are necessary if answers to our questions are to be found.

The Philistines and Iron

Several references have been made above to another problem connected with ironworking in ancient Palestine; the so-called "Philistine monopoly" on iron production.

Prominent biblical scholars such as Albrecht Alt (1968: 235 n. 9), Denis Baly (1974:132), John Bright (1981:186), and Norman Gottwald (1979:415), have interpreted 1 Sam. 13: 19-23 to mean that the Philistines had a monopoly on iron. The biblical writer states that there were no smiths to be found "in all the land of Israel" (1 Sam. 13:19) and that the Israelites had to resort to Philistine assistance in matters pertaining to metalworking. Iron is not, in fact, mentioned in the passage. Therefore other scholars, such as Yohanan Aharoni (1979:274) have cautioned against assuming that there was a Philistine monopoly on iron on the basis of an isolated passage. But the popular mind continues to cling to this view, as is evident in the 1981 edition of the Reader's Digest Atlas of the Bible (Gerdner, 1981:87) where again a Philistine monopoly of iron technology is asserted.

Recent studies by Jane Waldbaum (1979), T. Stech-Wheeler et al. (1981), and other archaeologists who specialize in ancient metallurgy, demonstrate that archaeological evidence from the Iron IA and IB periods does not support this assumption.[9] These studies have revived the question of iron's role in the relationship among the Philistines, the Israelites, and the Canaanites.

The Israelite "settlement"[10] in the hill country of Palestine, or more accurately the rise of the Yahwistic tradition, and the settlement of the Sea Peoples in Palestine's coastal regions occurred at roughly the same time, probably late in the 13th century B.C.E. They appear to have lived side by side for some time without a major conflict, but some time in the mid-12th century B.C.E. a struggle for power began. By that time the Philistines occupied the coastal plains, the Yahwistic Israelites were firmly established in the hill country, but the Canaanites had evidently been able to hold the northern plains. The biblical text asserts that for a time the Philistines held the upper hand in terms of military power and on numerous occasions defeated the Israelites in battle and started pressing in on the Israelite territory in the hills. The passage in 1 Sam. 13:19-23 occurs at a point in the text where the Philistine threat is very strong. This may be one reason that scholars have identified an "iron monopoly" and technological superiority with military ascendency.

The following chapters include material from the archaeological record, the Israelite literature, ethnographic studies, and studies on traditional art. These studies are consulted for the purpose of bringing several particular historical questions into focus; that is, how did the introduction if iron technology affect the relationships among the Israelites, the Canaanites, and the Philistines of Iron Age I Palestine? Did the Philistines introduce ironworking into the Near East? Was the military dominance of the Philistines over the Israelites during the 11th century B.C.E. due in part to a monopoly on ironworking? And finally, how did the understanding of iron technology affect Israel's understanding of her history when this history was recorded?

NOTES

[1]Although the author is unable to review many of the primary texts and is not competent in several of their languages, convenient, thorough surveys and summaries of the pre-Iron Age textual references exist. I depend upon the secondary studies for the lists that follow. Readers will be led to the primary material by references to the secondary authors cited.

[2]Iron has been found buried with other precious materials as foundation deposits in Middle Assyrian temples and Hittite palaces (Waldbaum, 1980:80).

[3]Iron did not become the predominant metal in Egypt, for example, until several centuries after it achieved dominance in the rest of the Near East.

[4]A clear example of this partial conversion is a transition from bronze knives or daggers with iron rivets in the Late Bronze Age to iron knives and daggers with bronze rivets in Iron Age I.

[5]Muhly asserted in an earlier article that iron technology originated in the Near East and spread from there to Cyprus and the Aegean (1980:51).

[6]See, for example, Dayton, 1971; Muhly, 1976, 1973 and 1980.

[7]Some of these "smelting operations" have since been questioned (Muhly, 1982:53).

[8]Liebowitz refers to an unpublished installation at Kamid el-Loz in Lebanon, dated to ca. the 15th century B.C.E. (1981:92 n.7.).

[9]Muhly apparently agreed with his colleagues in their 1981 article on Ta'anach that a Philistine monopoly was unlikely (Stech-Wheeler, et al.). But cf. his 1982 article where he asserts that it was possible (54).

[10]For an alternative explanation of the Israelite "conquest" and "settlement," see Mendenhall, 1970.

CHAPTER II

THE PHILISTINES AND THE ISRAELITES: A REEVALUATION OF DOMINANCE

Overview of Sites Yielding Iron Artifacts in Iron Age I Palestine

An evaluation of sites yielding iron artifacts from 12th, 11th, and 10th century B.C.E. contexts in Palestine follows. An interpretation of the evidence in light of the assertion of a Philistine iron monopoly is included. The inventory of iron objects from Early Iron Age levels in Palestine is taken primarily from Jane Waldbaum's 1978 catalogue in From Bronze to Iron (see Appendix for descriptions of artifacts). In general, the objects that were reported to her only second-hand were not included in her inventory (12). Sites and artifacts added to Waldbaum's catalogue will be noted.

Included in the brief overview of each site are: (1) the name of the site, i.e. the tell, area, cemetery, etc. excavated; (2) the geographical location of the site; (3) the type of the site, i.e. village, fortified city, cemetery, etc., and the size of the site if information is available; (4) the archaeological periods in which the site is known

to have been occupied; (5) contemporary textual references; (6) a brief description of the Iron Age I levels in each site; and (7) a description of the material characteristics of these Iron I levels.

Where possible, the material remains in the Iron Age I levels are designated Iron IA, Iron IB, and Iron IC, according to the chronology developed by Paul Lapp (1975:48-49). Iron IA (1200-1000 B.C.E.) and Iron IB (ca. 1150-1000 B.C.E.) overlap temporally and chronologically, but they appear to represent two distinctive cultures. Iron IB remains are usually attributed to the Philistines on the basis of a new pottery type that appeared in Philistine territory at about the same time they are known to have settled on the coastal plains of Palestine. Iron IA remains, evaluated on the basis of pottery and architectural types, are concentrated in the hill country west of the Jordan River, but are also found on its east bank. Archaeologists have often associated these remains with the Israelites. Some elements of the Late Bronze Age Canaanite culture also continue in Iron IA and B. Iron IC (1000-918 B.C.E.) remains indicate a fusion of cultures and are found throughout Palestine. A fuller description of the distinctive pottery types will be made later in this chapter.

The iron artifacts from each site are listed in the Appendix. They are divided by century (12th, 11th, and 10th), and are further divided into four functional

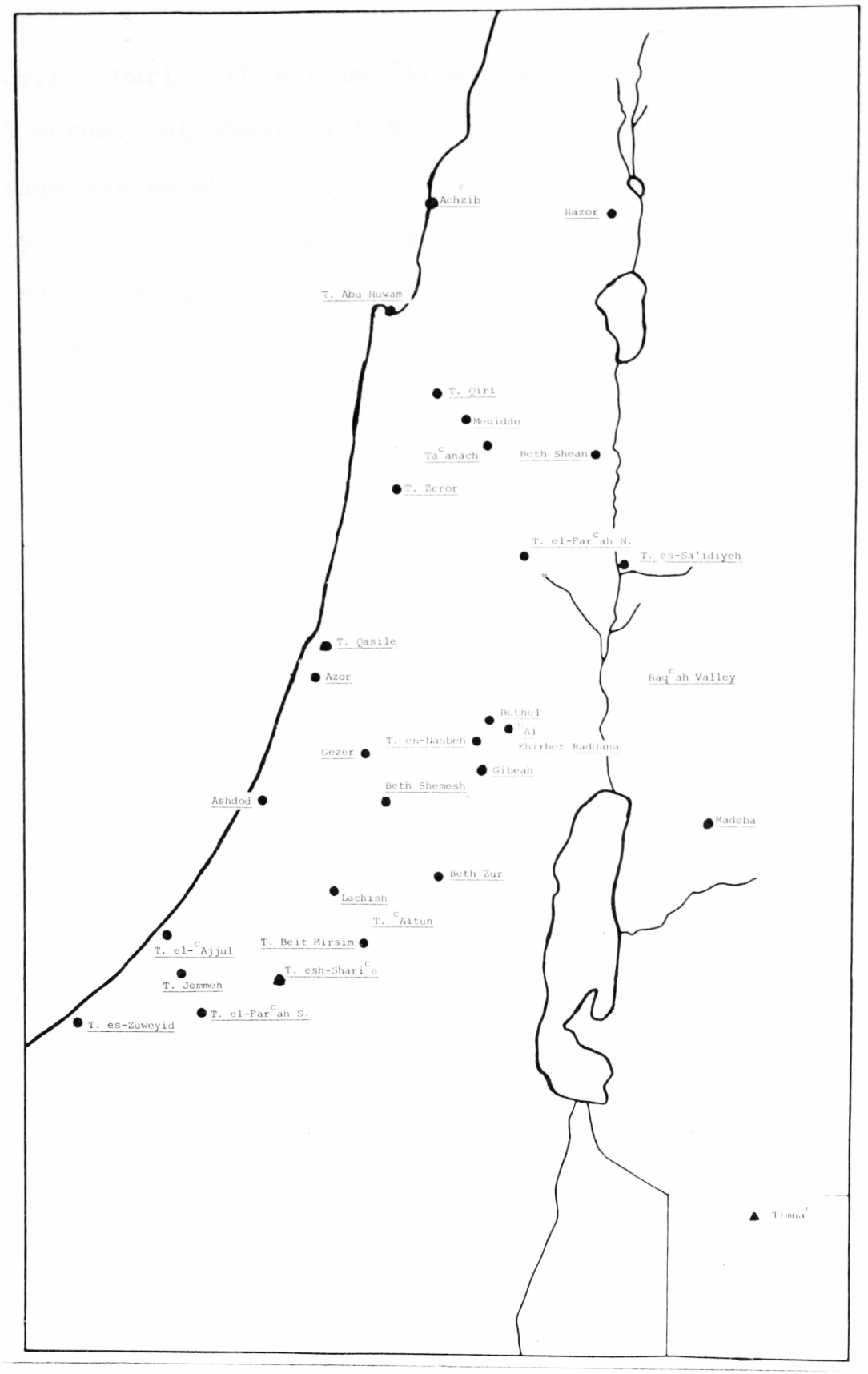
categories; tools, weapons, jewelry, and a miscellaneous category inclusive of all other types (Waldbaum, 1978). The context of each artifact as well as other artifacts associated with the same context will be noted where possible.

Achzib[1]

Ancient Achzib was a northern harbor city located in the northern coastal plain of Acco, 14 km. north of Acco. The site was settled in the Middle Bronze Age (ca. 1800 B.C.E.) and was occupied through the Crusader period. It was fortified in the Middle Bronze Age and was destroyed several times in the Late Bronze Age. It was refortified sometime in the Early Iron Age and reached its greatest expansion, 8,000 square meters, between the 10th and 6th centuries B.C.E. Two cemeteries, one south and one east of the city, have been uncovered. They contain Late Bronze Age burials and Iron Age rock-cut tombs. The biblical texts indicate that Achzib remained a Canaanite city following the "Israelite settlement" (Josh. 19:29, Judg. 1:31).

ʿAi (et-Tell)[2]

ʿAi or et-Tell (Hebrew הָעַי "the ruin") is located on the south side of the Wadi el-Jaya in Ephraim, the central part of the hill region in Palestine. The site was originally settled in Early Bronze Age IB (ca. 3100 B.C.E.), and was destroyed and abandoned in Early Bronze Age IIIB (ca. 2400



Map 1. Iron Age I Sites Yielding Iron Artifacts.
*Adapted from Aharoni, 1979:100.

B.C.E.). During this time ᶜAi was a fortified city covering 27.5 acres. At about 1220 B.C.E., a 2.5 acre unwalled village was established on the acropolis of the site. The Early Iron Age settlement was abandoned in about 1050 B.C.E. and never resettled.

The structure of the houses at ᶜAi during its Iron Age occupation seem to have been unique. They were characterized by a central courtyard with long narrow rooms on either side, and a pillar or pier and four-arch construction. A water cistern was associated with each house. Two phases can be distinguished in the architecture of the site. Although there was no fundamental change, the second phase appears to have been one of extensive repairing and rebuilding of the structures of the first phase.

Two phases can also be distinguished in the pottery, the first characterized by a long, collared-rim jar (Iron IA) and the second by a low-profile collared-rim jar and one with a beveled rim and no collar.

The remains at the site indicate that the Iron Age villagers were farmers and shepherds. Stone saddles, querns, mortars, pestles, and agricultural implements illuminate the agricultural dimension of the village, and the large amount of goat and sheep bones in every house indicate the possession of flocks.

Ashdod[3]

Ashdod, one of the five cities of the Philistine pentapolis, is located four miles inland from the Mediterranean in the southernmost coastal region of Palestine, the Philistine Coastal Plain. The ancient settlement has been partially destroyed by cultivation and building activity, so it is difficult to determine the exact extent of the mound. It has been estimated that the city on the acropolis covered approximately 20 acres, and the lower city at least 70 acres. Excavations have revealed twenty-three strata of settlement ranging from the Middle Bronze Age (ca. 1650-1600 B.C.E.) through the Byzantine period. The city is referred to in the LBII texts from Ugarit indicating that Late Bronze Age Ashdod was a textile center trading in dyed garments. It is also repeatedly referred to in the biblical text in association with the Philistines (e.g. Josh. 11:22, 13:3; 1 Samuel 5).

The transition from the Late Bronze Age Canaanite city to the Early Iron Age Philistine city is clearly represented stratigraphically. A thick layer of ash in a large percentage of the excavated portions of the site is superimposed on the Late Bronze Age remains. The next phase of settlement is characterized by the introduction of Iron IB cultural elements. The evidence indicates that the city was refortified in the 12th century B.C.E. and that the fortifications were subsequently destroyed in the first half of the 10th

century B.C.E. The Iron Age city included the fortress, houses, cultic installations, and various workshops.

The earliest phase of Iron IB is characterized by a continuation of the Late Bronze Age Canaanite pottery tradition and locally manufactured Mycenaean and Philistine wares. The 11th century remains include an abundance of Philistine (Iron IB) pottery as well as "plain Iron Age I pottery" used for utilitarian purposes (Dothan, 1982:41). Philistine pottery begins to disappear in the 11th century levels and is not found in 10th century levels.

Azor[4]

Azor is located on the northern edge of the Philistine Coastal Plain. It is mentioned in Josh. 19:45 and in an Assyrian inscription relating to Sennacherib's conquest of Azor. The mound itself has not yet been excavated, but surveys and salvage excavations have uncovered traces of occupation in the Chalcolithic, Middle Bronze II, and Iron Age periods. The finds include a complete range of Philistine pottery, from the earliest types to the later debased, assimilated types. Unique to the Azor pottery tradition is a very elaborate type of decoration not found elsewhere.

The Baqᶜah Valley (Jordan)[5]

The Baqᶜah valley is located on the central Transjordanian plateau about twenty km. northwest of present-day Amman. A series of Late Bronze Age II and Iron Age IA

burials have been uncovered in the Ummad-Dananir region of the valley. Two major sources of iron ore in the Wadi Zarqa and Ajlun regions are located ten and eighty km. north of the burial site.

Bethel[6]

Bethel is mentioned more frequently in Old Testament texts than any other town except Jerusalem. It is located near the Wadi eṭ-Ṭaḥûneh in the southern part of the high hill region of Mount Ephraim. There is evidence of occupation during the Chalcolith and from the Middle Bronze Age down to the Byzantine period. A definite cultural break between the Late Bronze Age and the Early Iron Age is indicated by a thick layer of ash and rubble and a decline in material culture. The Iron Age I material culture is characterized by the use of piers in masonry, "ramshackle huts," and poorly made pottery. The pottery inventory from this period consists primarily of collared-rim storage jars and cooking pots (Iron IA). Two phases are evident in the construction of the collared-rim storage jars. The earlier storage jars have a high collar and the later have heavy rolled rims. A very small amount of Philistine (Iron IB) pottery has been found at Bethel.

Beth Shean[7]

Beth Shean is situated between the Jezreel and Jordan Valleys, and was occupied almost continuously from the

Neolithic period (ca. 3500 B.C.E.) to modern times. Beth Shean is mentioned in the 19th century Egyptian Execration texts, the topographical lists of Thutmose III in the temple of Amon at Karnak (ca. 1468 B.C.E.), the el Amarna letters, inscriptions of Seti I and Ramses, the Papyrus Anastasi (13th century B.C.E.), and the Shishak lists at Karnak (ca. 925 B.C.E.). The biblical texts indicate that Beth Shean was one of the Canaanite towns that resisted Israelite attack (Josh. 17:11 and Judg. 1:27). The exposure of the bodies of Saul and his sons on the wall of Beth Shean by the Philistines is referred to in 1 Sam. 31:12.

Beth Shean has been recognized as one of the most important Egyptian strongholds during the Late Bronze and Early Iron Ages. Many vessels of Egyptian shape come from Late Bronze and Early Iron Age levels in addition to local Canaanite types that are a continuation of the Late Bronze Age Canaanite culture. Mycenaean pottery types are also included in the 12th century inventory. There are only a few examples of the collared-rim jar (Iron IA) and very little Philistine (Iron IB) pottery. The small amount of Philistine pottery recovered from Beth Shean is the debased type of the last phase of Philistine pottery (late 11th century B.C.E.). The exception is one elaborately decorated sherd that was not "well stratified" (Dothan, 1982:82).

The question of a Philistine influence at the site remains unclear. A Philistine presence, probably as part

of an Egyptian garrison, has been asserted by some on the basis of a number of Early Iron Age burials with associated clay coffins (e.g. Dothan, 1982). Several problems are inherent in this interpretation. First, the lack of associated Philistine pottery, and second, the fact that many of these "burials" are actually groups of objects that had been thrown out of their original rock-hewn chambers. Frances James has interpreted the evidence differently.

> If we follow the archaeological criteria, we must conclude, then, that the "Philistines" of the Pentapolis--defined as the users of a certain type of pottery found in southern Palestine--do not seem to have held Beisan. (James, 1966:137)

James suggests, rather, the presence of another group of Sea Peoples in addition to the local Canaanites.

It is generally agreed that by the 10th century B.C.E. Beth Shean was under Israelite influence.

Beth Shemesh (ᶜAin Shems)[8]

Beth Shemesh is situated in the northeastern Shephelah lowlands. Its location is mentioned in Josh. 19:41, 21:16, and 1 Kgs. 4:9. Reference is also made to Beth Shemesh as the city where the Ark was returned by the Philistines (1 Sam. 6:9ff.). With the exception of the biblical text, Beth Shemesh is not mentioned in any ancient documents. The town was founded in the Middle Bronze Age and existed up to the Byzantine period, with some interruptions in occupation. The area of the ancient city was approximately seven acres.

It was fortified from ca. 1700-900 B.C.E. The original excavator in 1911 (D. MacKenzie) identified four main strata. Stratum III and parts of Stratum II have been dated to Iron Age I.

Stratum III is characterized by an abundance of Philistine pottery (Iron IB), typical of the 12th and first half of the 11th century B.C.E., and a thick destruction layer. There are no examples of the third phase debased type of Philistine pottery. Also present in this stratum were Egyptian wares, collared-rim jars typical of Iron IA material culture, and evidence of furnaces used for copper smelting (Wright, 1975:252). Although it is difficult to determine the date of the end of Stratum III, a date of ca. 1000 B.C.E. is probable, because Cypro-Phoenician wares and high-necked juglets with flat button bases occur in this level and cannot be dated prior to the 10th century and late 11th century respectively.

Strata IIa and IIb are dated to the early and late 10th century B.C.E. and are characterized by pottery similar to much of the pottery in the destruction layers of Stratum III, including the collared-rim jar. Philistine wares are absent.

Beth Zur[9]

Beth Zur is located on the eastern edge of the Judean Hill Country. The site was sporadically occupied beginning in the Chalcolith period. It was fortified in the Middle

Bronze Age IIB, and occupied approximately three acres during that time. The city was destroyed ca. 1560 B.C.E. and abandoned for approximately three centuries. It was resettled in the Early Iron Age, abandoned again ca. 1000 B.C.E. and was not resettled again until the 7th century B.C.E. It was occupied from this time until about 100 B.C.E., when it was again abandoned and never resettled. Mention of the Iron Age city of Beth Zur is made in Josh. 15:58, 1 Chr. 2:45, and 2 Chr. 11:17.

Iron Age I architecture at Beth Zur is characterized by poor masonry and the reuse of earlier structures. An abundance of collared-rim jars (Iron IA) come from 11th century contexts. Philistine ceramic finds at Beth Zur are "quite meagre and atypical and belong to a debased version" (Dothan, 1982:44).

Gezer (Tell Jezer)[10]

The site of ancient Gezer is a thirty acre mound situated in the foothills of the Judean range where it slopes down into the Shephelah region. It was occupied almost continuously from the Chalcolithic period through the Roman-Byzantine period. Gezer is mentioned in texts from Egypt and Mesopotamia and in the biblical text. Those from Egypt are an inscription of Thutmose III (ca. 1490-1436 B.C.E.) at Karnak; an inscription of Thutmose IV (ca. 1410-1401 B.C.E.) in his mortuary temple at Thebes; the

Amarna letters (ten letters from three different kings of Gezer); and Merneptah's "Israel" stela (ca. 1220 B.C.E.). A single possible reference to Gezer from Mesopotamia is a relief of Tiglath-Pileser III (ca. 745-728 B.C.E.). A number of references occur in the biblical text. These include Josh. 10:33, 12:12, 16:3 and 10, 21:21; Judg. 1:29; 1 Chr. 6:67, 7:28, 14:16, 20:4; 2 Sam. 5:25; and 1 Kgs. 9:15-17. Together these texts confirm that no Israelite occupation of Gezer occurred until the time of Solomon (mid-10th century B.C.E.).

The first excavator of the site (MacAlister) failed to note the position of most of the finds, so much of the dating from this excavation is based on typological evidence alone. The tombs, however, can be dated with greater certainty. Later excavations did control for stratigraphy and chronology. The combined evidence suggests a partial break in material culture at the very end of the 13th century B.C.E. and the beginning of the 12th century B.C.E. (Stratum XIV). The ceramic assemblage from this level is made up mostly of local traditions of a degenerate Late Bronze Age type. It has been suggested that this is a post-destruction level resulting from the conquest claimed by Pharoah Merneptah ca. 1220 B.C.E. (Dothan, 1982:52). An ivory pendant bearing two cartouches of Merneptah supports this conclusion. There is no evidence that the destruction accompanied the Sea Peoples' arrival in the early 12th century B.C.E.

An abundance of Philistine pottery (Iron IB) of almost every known type in Strata XIII-XI (12th and first half of the 11th centuries B.C.E.), has been interpreted as indicating that Gezer was under the influence of the Philistines at this time. It is difficult, however, to determine whether the city was actually controlled by the Philistines in the 12th and 11th centuries B.C.E. The biblical text usually refers to Gezer as a sort of buffer zone between Philistia and Israel, and other passages imply that it was the farthest outpost of Philistine influence (2 Sam. 5:25; 1 Chr. 14:6, 20:4).

Stratum X to IX (late 11th century to early 10th century) are usually identified as post-Philistine or pre-Solomonic. Stratum IX ended in destruction. (1 Kgs. 9:16 states that Gezer was captured and burned in the campaigns of an Egyptian pharoah.)

The first level attributed to Israelite occupation is Stratum VIII (mid-10th century B.C.E.). The domestic architecture of this level is described as unimpressive (Dever, 1976:441). To this stratum is assigned a typical Solomonic four-entryway gate.

Gibeah (Tell el-Ful)[11]

The ancient fortress of Gibeah is located in the Mount Ephraim region. A minor settlement existed at the site during the Middle Bronze Age. The town, covering an area of

about thirty dunams, was founded at the beginning of the 12th century B.C.E. and was occupied until sometime in the first century C.E. Textual references to Gibeah include Judges 14 and 19-20; 1 Sam. 10:26, 11:4, and 15:34ff.; 2 Sam. 23:29; 1 Chr. 11:31 and 12:3; and 2 Chr. 13:2. The passage in Judges 19-20 describes the town's destruction by burning. It is reported in 1 Sam. 10:26 and 11:4 to have been Saul's residence before his rise to royal rank. 1 Sam. 15:34ff. indicates that following a battle in which he defeated the Philistines, Saul returned to Gibeah to again make it his residence. One of David's warriors is also recorded as coming from Gibeah (2 Sam. 23:29 and 1 Chr. 11:31).

Five periods have been distinguished in the archaeological strata at Gibeah, two of which fall in Iron Age I. Period I of the Iron I strata is dated to the 12th century B.C.E. and Period II to the 11th century B.C.E. (IIA--the first half of the 11th century B.C.E. and IIB--the second half). The collared-rim storage jar (Iron IA) is the distinguishing feature of Period I. In Period II the fortress was established. Pottery types characteristic of this period are the transitional form of the collared-rim jar with a heavier rim (ca. mid-11th century B.C.E.) and cooking pots typically found in 11th century B.C.E. contexts. There is no mention of any Philistine (Iron IB) pottery from Gibeah.

Hazor[12]

Hazor is a northern site situated in the Huleh Valley near the Jordan Rift Valley in Upper Galilee. The ancient city consisted of an upper city located on the tell proper (that covered about twenty-five acres at its base) and a lower city on the plateau (up to seventy-five acres). The site was occupied from the Early Bronze Age down to 732 B.C.E. when the fortified Israelite city was destroyed by a conflagration ascribed to the conquest of Tiglath-pileser III. The city is first mentioned in the Egyptian Execration texts (ca. 19th-18th centuries B.C.E.) and frequently thereafter in Egyptian texts, including the Amarna letters. The frequent reference to Hazor in Egyptian texts coupled with its mention in the 18th century B.C.E. Mari texts, indicates that Hazor was a flourishing commercial center in the Bronze Age. Biblical references to the city include a description of its destruction and burning by Joshua during the Israelite "conquest" (Josh. 11:10-13) and its reconstruction during the reign of Solomon (1 Kgs. 9:15).

Twenty-one strata of occupation have been identified, three of which (XII-X) have been assigned Iron Age I dates. The stratum directly below these Iron I strata (XIII) indicates that the city was at its peak of prosperity in Late Bronze Age II. Before the close of the 13th century, the city was destroyed by conflagration and evidently abandoned

for a short period of time. The 12th century stratum (XII) indicates that a small settlement was established at this time. This settlement's material remains consist primarily of deep silos, hearths, and foundations for tents and huts, that suggest it was not permanent. The typical pottery of this period is similar to the collared-rim jar generally found at 12th century Iron IA sites. The typical Iron I cooking pots found throughout Palestine are also present. Traces of permanent settlements have been found in the next stratum (XI), dated to the 11th century B.C.E. This stratum's most distinctive feature is a bamah, or "high place." The artifact inventory of this feature includes incense vessels and a foundation deposit consisting of a jar containing a cache of bronze objects, which included weapons, and a statuette of a male deity. In the 10th century (stratum X) Hazor was rebuilt as a fortified city. This project has been attributed to Solomon on the basis of stratigraphy, pottery, and biblical references.

Khirbet Raddana[13]

Salvage excavations at Khirbet Raddana, located near ᶜAi (et-Tell) in the central hill region of Ephraim, uncovered an Early Iron Age settlement. Two building phases were evident. Houses exposed during the excavations indicate that the small apparently unfortified site was contemporary with Iron Age I ᶜAi. The collared-rim jar (Iron IA) was

present in both phases at Raddana. The site was evidently destroyed and abandoned before the use of this pottery type terminated in Palestine. The mid-11th century has been established as the latest possible date for the destruction (Aharoni, 1971:134).

A significant find from this site is a jar handle inscribed with a clan name. The inscription has been dated by Aharoni (1971:132) to ca. 1300 B.C.E.

Lachish (Tell ed-Duweir)[14]

Lachish was a prominent city in Palestine's Shepelah region. It was occupied with several interruptions from the Chalcolithic period to the Persian period, with its peak of development in the Late Bronze Age. The Late Bronze Age walled city occupied about seventy-five dunams (eighteen acres). This Late Bronze Age settlement was burned and destroyed ca. 1234 B.C.E.

The Canaanite city of Lachish is first mentioned in the 14th century B.C.E. el-Amarna letters. It is further mentioned in a contemporary letter found at Tell el-Hesi. The biblical references include a description of the city's defeat by Joshua and its subsequent inclusion in the territory of Judah (Josh. 10:15, 10:26, 15:39 and 32-33).

The absence of biblical references to Lachish between the times of Joshua and Rehoboam are in accord with the lack of building activity represented in the Iron Age I strata of the site.

Madeba[15]

The ancient town of Madeba, located in the plains of Transjordan (ancient Moab), is first mentioned in Num. 21:30 as a town taken over by the Ammonites. Joshua's conquest of the town during the Israelite "conquest" is also mentioned. Further references are in 2 Samuel 10 and 1 Chronicles 19. A modern Christian town presently exists at the site. The only area that has been excavated is a tomb in a large natural cave east of the ancient tell. The tomb is Late Bronze Age/Early Iron Age (with a latest possible date of ca. 1150 B.C.E.).and was apparently used for several generations. It is similar to some of the fosse tombs found at Tell el-Far^{c}ah South. There are further connections with Lachish, Beth Shean, and Tell Beit Mirsim. No Philistine ware (Iron IB) was found in the tomb, but some Mycenaean pottery--indicating some foreign influence--was present.

Megiddo[16]

The ancient fortified city at Megiddo in the Jezreel Valley, covered an area of about sixty dunams (fifteen acres) at the top of the tell, and was enlarged in various periods by a lower city. There is evidence of occupation from the Chalcolithic period down to the Persian period, with the first fortifications appearing by the Early Bronze Age.

The name of the city appears in a 15th century B.C.E. inscription of Thutmose III, in one of the Ta^{c}anach letters,

one of the el-Amarna letters, in the city lists of Thutmose III and Seti I, and in the Papyrus Anastasi (dated to the reign of Ramses II). All of these texts indicate that Megiddo was an important Canaanite city in the Bronze Age. Biblical references in Judg. 5:19 and Josh. 12:21 refer to a battle fought near Megiddo. Josh. 17:11-13, Judg. 1:27-28 and 1 Chr. 7:29 list it among the Canaanite cities not conquered by the tribe of Manasseh. It is further mentioned as being among the cities fortified by Solomon in 1 Kgs. 4:12 and 9:15.

Although in some cases the stratigraphic evidence is unclear (Yadin, 1976:830-56), the following stratum have been attributed to Iron Age I occupation (Rast, 1978:4):

Stratum VIIB	late 13th century B.C.E.-ca. 1175 B.C.E.
Stratum VIIA	ca. 1175-1125 B.C.E.
Stratum VIB	ca. 1075-1050 B.C.E.
Stratum VIA	latter half of 11th century B.C.E.
Stratum VB	early 10th century B.C.E.
Stratum VA-IVB	late 10th century B.C.E.

The Late Bronze Age strata yield evidence of a flourishing city influenced by the Egyptians. Stratum VIIA follows the Late Bronze Age strata and is the earliest level that can be ascribed with any certainty to the Iron Age. A layer of debris and clear signs of destruction separate Strata VIIB and VIIA, especially in the structure designated as a palace where a treasure hoard including a number of ivory objects

was uncovered in earlier strata. Most of the public buildings of Stratum VIIB, including the palace that was rebuilt on a smaller scale, were reused in this period, and the Late Bronze Age culture seems to have continued. This level's date has been determined by the presence of Ramses III and Ramses IV cartouches. Both Philistine ware (Iron IB) and the collared-rim jar (Iron IA) were present in Stratum VIIA. Some Philistine sherds were found in association with the Ramses III cartouche. Dothan has interpreted the presence of Philistine pottery as evidence of a Philistine garrison stationed at Megiddo (1982:76).

The city of Stratum VIIA was totally destroyed. The succeeding occupation of Stratum VIB is characterized by buildings of very poor construction, and absence of fortifications and cultic structures. A poor assemblage of Philistine ware[17] and some jars of the collared-rim type were found (Albright, 1940:548).

New and extensive building activities are evident in Stratum VIA. The newly planned and well-built city included public buildings and some fortifications. An abundance of metal tools and pottery finds came from this level, including Philistine ware[18] and ceramic remains "typical of the 11th century B.C." (Yadin, 1976:851). W. F. Albright has asserted that "the dominant ceramic type (of VI) is the collared store-jar" (1940:548). This level was destroyed by conflagration.[19]

The buildings of the succeeding level, Stratum VB, are poorly built and indicate a period of decline. The city of this level appears to have been completely unfortified and is perhaps a product of the "first Israelite occupation of Megiddo" (Yadin, 1976:85l).

Stratum VA and succeeding strata evidence another period of renewed building activity, probably during the reign of Solomon (Yadin, 1976:85l).

Ta^{c}anach[20]

Tell Ta^{c}anach is a forty-five dunam mound located forty-five meters above the Jezreel Plain. There was no natural water supply at the site, so a system of cisterns was used in ancient times. The earliest city dates to EBII-III (ca. 2700-2400 B.C.E.). Following a significant gap, there is evidence of a Middle Bronze Age campsite (ca. 1700 B.C.E.) which was followed by a settlement characterized by poorly constructed domestic architecture and fortifications. A collection of thirteen Akkadian cuneiform tablets, eight letters to local kings, and five administrative name lists, come from the 15th-14th century B.C.E. strata. Another significant gap in occupation seems to have occurred between the mid-15th and late 13th centuries B.C.E. The site was reoccupied in the late 13th century and was finally destroyed in 918 B.C.E. Evidence for later occupation is limited to a tower dating to the 9th century B.C.E.,

some 5th century B.C.E. Persian period pits and rooms, and an elaborate palace of the 10th to 11th century C.E. The site was protected by city walls in all major periods, and was probably a satellite of Megiddo.

The earliest textual reference to Ta^{c}anach is in a 15th century B.C.E. inscription of Thutmose III at Karnak. Both Thutmose III in 1468 B.C.E. and Shishak I in 918 B.C.E. list Ta^{c}anach as a city captured by their forces. In Judg. 5:19 ("The Song of Deborah"), Ta^{c}anach is mentioned as the site of a battle between the Israelites and Canaanites. The king of Ta^{c}anach was reportedly taken by Joshua (Josh. 12:21) and the city subsequently assigned to Issachar and Asher. It was later given to the tribe of Manasseh (Josh. 17:11, 1 Chr. 7:29) but they failed to occupy it because of the Canaanites' strength (Judg. 1:27). Canaanite tribute to Israel is referred to in Judg. 1:28. Ta^{c}anach is further referred to in Josh. 21:25 as a Levitical city and in 1 Kgs. 4:12 as one of Solomon's districts.

Four phases of occupation are evident in the Iron Age I strata of Ta^{c}anach as follows (Rast, 1978:6):

IA	ca. 1200-1150 B.C.E.
IB	ca. 1150-1125 B.C.E. (destruction ca. 1125 B.C.E.)
IIA	ca. 1020-960 B.C.E.
IIB	ca. 960-918 B.C.E.

A 12th century house dating to IA consisted of rooms surrounding a courtyard. A later structure dated to IB was

built over it. This is indicative of the interruption in building activities between IA and IB that were resumed in IB. The IB city was destroyed ca. 1125 B.C.E. and the site was apparently not resettled until ca. 1020 B.C.E. at which time construction of a substantial number of structures and installations began. A "Cultic Structure" from Period II is especially important in the present discussion.

The collared-rim type of storage jar (Iron IA) was present in all Iron Age I levels.

The site was probably incorporated into the Israelite kingdom during the time of David and was destroyed by Shishak in 918 B.C.E. It was never associated with the Philistines.

Ta^{c}anach is the only site at which a substantial study of Iron Age I iron artifacts has been made (Stech-Wheeler et al., 1981). The iron artifacts from this site have been recognized as one of the largest groups of closely datable such artifacts from Palestine, because many of them have come from well-stratified contexts (247). The largest group of iron artifacts from the site were recovered from the two rooms that comprise the "Cultic Structure" and the associated courtyard area containing a plastered basin. The basin has been interpreted as having had a cultic function (248). The inventory of artifacts from this structure includes a mixture of cultic and secular material: astragali, eighty vessels (some still containing grain), loomweights, querns and various other stone objects, large quantities of

beads, weights and whorls, a large number of bronze and iron objects, a stelae, and a mould of a female figurine. A cult stand was found in a nearby cistern. Also found in this structure was material associated with metalworking: tuyéres, a broken copper tool, copper spillage and "corroded amorphous bits" that may have resulted from casting operations (Stech-Wheeler et al., 1981), and two unfinished iron objects. The evidence suggests that some kind of metallurgic activities may have taken place here, perhaps under religious auspices (256), and that the metal objects were a collection of broken or damaged items set aside for later repair (248). A similar collection of iron artifacts was uncovered at Megiddo.

Eleven of the iron artifacts from 10th century contexts at Ta^{c}anach were tested by Stech-Wheeler et al. for carbon content. Of these eleven objects, six showed detectable carburization. It was inferred from the test's results that tools made for constant heavy use were carburized (255).

Tell Abu Huwam[21]

Tell Abu Huwam is the site of a small ancient harbor city located on the Plain of Acco near Megiddo and Ta^{c}anach. The settlement was founded ca. 1400 B.C.E. and was occupied, with some gaps, until the Byzantine period. It has been suggested that the settlement was founded by the Egyptians during the time of Sethos I to serve as an Egyptian navy base and port (Maisler [Mazar], 1951b:22).

The Late Bronze Age/Early Iron Age Stratum V revealed fortifications and contained Mycenaean and Cypriot pottery, indicating foreign trade. The site was destroyed in the first quarter of the 12th century B.C.E.[22] There is evidence of another destruction and a subsequent abandonment ca. the mid-12th century B.C.E. (Stratum IVA). The site was resettled in the late 11th century B.C.E. (Stratum IVB) on a smaller scale. Several small residential units were found in this stratum, each consisting of two rooms and a closed court. New fortifications were built in the Stratum III settlement (late 10th century B.C.E.). Also belonging to Stratum III was a large structure, probably a public building, containing Samaria ware and imported Thessarian ware (10th-9th centuries B.C.E.). No Philistine ware (Iron IB) was found in any of the Iron Age I levels. Another destruction occurred at the end of the 9th century B.C.E. The site was not resettled until the Persian period.

Tell ᶜAitun[23]

Tell ᶜAitun is a Bronze Age/Iron Age site located in the Shephelah region of Palestine. A number of Bronze and Iron Age tombs were uncovered in the extensive cemetery associated with the site. Among these were a row of Late Bronze Age/Early Iron Age tombs hewn into the slope several hundred meters from the mound. One tomb contained Philistine pottery (Iron IB)[24] as well as pottery that was typical of the 12th century. The artifact inventory included bronze jewelry,

bronze arrowheads, and beads. One of the deceased had a bronze necklace with three stone seals on his chest, which T. Dothan ascribes to the Philistine culture (1982:44). Another tomb (12th century) contained a rich assemblage of bronze knives and other utensils, iron bracelets, and an abundance of pottery.

Tell el-ᶜAjjul[25]

Tell el-ᶜAjjul, located in the Philistine coastal plains, was a major city in the Bronze Age. The site has been identified as both Beth ᶜEglayim (Tufnell, 1975:52) and Sharuḥen (Kempinski, 1974). It was settled and fortified during the Middle Bronze Age, and was a large flourishing city. Following a destruction of ca. 1570 B.C.E. there was a decline in material culture and the site was finally abandoned ca. 1200 B.C.E. There are very few indications of Iron Age and later occupation.

Because most of the mound proper is still unexcavated, the bulk of material evidence for the site comes from the extensive cemeteries to the east and west of the mound. No strata on the mound can be dated to Iron Age I, but Iron I remains in the cemetery suggest that it was still in use at the time. A small amount of Philistine pottery, mainly from the last phase, was found in tombs 1139 and 1112.

Tell Beit Mirsim[26]

Tell Beit Mirsim is an eight acre mound located at the edge of Palestine's high hill country where it merges with

the Shephelah. W. F. Albright asserts that this site should probably be identified with biblical Debir (1975:171-72). References to ancient Debir during the "conquest" period include Josh. 10:36, 11:21, 15:19 and 15:48-50 (where Debir is listed as a city in the sixth district of Judah), and Judg. 1:15. It is listed as a priestly town in Josh. 21:15 and 1 Chr. 6:58.

The site was first occupied in the Early Bronze Age (ca. 2300 B.C.E.) and was abandoned for a period of about 300 years between ca. 2200 B.C.E. and the 19th century B.C.E. (Middle Bronze Age). The Middle Bronze Age settlement was a fortified city that reached its peak of prosperity in the period between 1700 B.C.E. to 1540/30 B.C.E. The city was destroyed ca. 1540/30 B.C.E. and was again abandoned for a period of about 100 years. A smaller but still fortified Late Bronze Age settlement followed. The Iron Age settlement, which was sparsely settled, was destroyed ca. 918 B.C.E., resettled following the destruction, and was finally destroyed ca. 587 B.C.E. and never resettled again.

The Iron Age I Stratum at Tell Beit Mirsim has been divided into three phases by the excavator, B1 (pre-Philistine), B2 (Philistine), and B3 (post-Philistine). This stratum indicates a sparse settlement. Most of the pottery finds come from grain pits. B1 (12th century B.C.E.) is poor in architectural and pottery remains, and contains some pottery of the collared-rim store-jar type (Iron IA).

The characteristic pottery of this phase is a decadent Late Bronze Age type. No Mycenaean, Cypriot, or Philistine ware (Iron IB) was found. B2 (late 12th to 11th century) is characterized by Philistine pottery (Iron IB). Both Phase 1 and Phase 2 are represented, and one sherd of the debased type of the last phase was found. No Philistine ware is represented in Phase B3.

Tell el-Farᶜah North[27]

Tell el-Farᶜah North, generally identified as the biblical site of Tirzah (de Vaux, 1976:395), is located in the northern part of the Mount Ephraim region in Palestine's central hill country. Tirzah is mentioned in Num. 26:33 and 36:10-11 and in Josh. 17:3.

The site was first settled in the pre-pottery stage of the Neolithic period. The Neolithic settlement was very small and poor in material remains. It grew in the Chalcolithic period and by the Early Bronze Age the first buildings and fortifications were erected. The site was abandoned ca. 2500 B.C.E. and was not reoccupied until about 600 years later in the Middle Bronze II period, during which there existed a very small and poor settlement. By ca. 1700 B.C.E. the settlement had become larger and been refortified. The Late Bronze Age Stratum is not well preserved, so it is difficult to determine the extent of its occupation. In the Iron Age I Stratum III (1200-1000 B.C.E.) a number of the four-room type of houses were uncovered. The culture of this

stratum, judging from cultic installations, appears to have been Canaanite. The city was destroyed about the end of the 10th century B.C.E., but wasn't completely abandoned until ca. 600 B.C.E.

Tell el-Farᶜah South (Tell Sharuhen)[28]

Tell el-Farᶜah South, normally identified with ancient Sharuhen, is located in the western Negev along the southern boundary of Philistia. The city is mentioned in the descriptions of Egyptian military expeditions of Ahmose, Thutmose III, and Shishak, and in Josh. 19:6.

Excavations at the site have revealed that it was occupied from the Middle Bronze Age IIB period (ca. 1750 B.C.E.) through the Roman period, with one significant gap in occupation between the 9th and 7th centuries B.C.E. The evidence suggests that the city was a rich and densely populated settlement. There is also evidence of an Egyptian presence starting at the beginning of the Late Bronze Age, and abundant evidence of the Philistine material culture (Iron IB) in tombs and occupation levels dating from the 12th and 11th centuries B.C.E. Iron IB remains include tomb architecture, anthropoid clay coffins,[29] pottery, weapons, and seals (Dothan, 1982:27). The stratigraphy is relatively clear in parts of the site and supports the division of Iron IB pottery into three phases that can be dated fairly accurately (27). The tombs at Tell el-Farᶜah South seem to reflect Mycenaean influence.

Tell en-Nasbeh[32]

Tell en-Nasbeh is located north of Jerusalem in the Judean hill country. It is normally identified with biblical Mizpah which is mentioned as a place where the Israelites prepared for battle against Gibeah (Judg. 20:1ff.), as one of the places that Samuel was active (1 Sam. 7:16-17), and as a city that was fortified by Asa after the end of the divided monarchy (1 Kgs. 15:17-22).

The site, which covered an area of thirty-two dunams within the walled city, was excavated in its entirety and revealed evidence of occupation during the late fourth millennium/early third millennium B.C.E. and from ca. 1100 to 400 B.C.E. The conclusions of the excavators were based almost entirely upon typological considerations because the stratigraphy of the site was poorly preserved. A wall was constructed around the 11th century B.C.E. city, but the "Great Wall" was built some centuries later, probably in the 9th century B.C.E. Most of the Early Iron Age houses were poorly constructed. Three examples of the four-room type of house were found. The Early Iron Age pottery inventory includes both Philistine pottery (Iron IB) (forty-seven sherds) and "one of the richest and most complete collections of Israelite pottery" (Broshi, 1976:916), especially in some of the tombs that contained iron objects (see below, tombs 32 and 54). Included in the "Israelite" pottery collection from

Tell en-Nasbeh were some jars of the collared-rim type (Iron IA).

Tell es-Sa'idiyeh[33]

Tell es-Sa'idiyeh is located in Transjordan, 1.8 km. east of the Jordan River on the south bank of the Wadi Kufrinjeh. Forty-five burials from a cemetery situated above Early Bronze Age remains were excavated. The ceramic evidence indicates that these burials were in use from the last half of the 13th century B.C.E. through the first half of the 12th century B.C.E. Four Iron Age levels of occupation were distinguished. There is also evidence of occupation from the Persian period through the Roman period.

Tell esh-Shari^{c}a (Tel Sera^{c})[34]

Tell esh-Shari^{c}a is situated in the northwestern Negev, and has been identified by some scholars as ancient Ziklag (Oren, 1976:1059). Ziklag is mentioned as a city of Judah (Josh. 15:31), and as a city in the territory of Simion (1 Chr. 4:30). It is also referred to as being in the "country of the Philistines" (1 Sam. 27:6-7) and "south of the Cherethites" (1 Samuel 30). As a Philistine stronghold, the King of Gath gave it to David for refuge during his flight from Saul (1 Sam. 27:6).

The ancient city at Tell esh-Shari^{c}a covered an area of approximately sixteen dunams and was inhabited from the Middle Bronze Age through the Persian period (ca. the 17th

through the 4th centuries B.C.E.) and also during the Roman and Byzantine periods. There was limited occupation during the Chalcolithic and Early Bronze Age. The Iron Age I Stratum (VIII) is situated directly above the Late Bronze Age destruction level, but has not revealed any remains from the second half of the 12th century B.C.E. A number of houses of the four-room type, which has been considered the typical architectural plan of "Israelite" houses, were found in this stratum. Because of the presence of typical late phase Philistine pottery in the earliest of these houses (11th century), it has been suggested that the four-room house was originally a Philistine architectural tradition that was later adopted by the Israelites (Oren, 1976:1064; Dothan, 1982:87).

Tell es-Zuweyid[35]

Tell es-Zuweyid was a frontier town on the Egyptian border of the Northern Sinai coast. It is the southernmost site at which Philistine pottery has been found. According to Dothan, the meagre assemblage comes from Levels N and M, which are not clearly distinguished.[36] The dates of the Iron Age levels at Tell es-Zuweyid are not clear. Dothan states that Level N may span a period from the second half of the 12th century B.C.E. to the 10th century B.C.E., and that the approximate date of the beginning of level M is the second half of the 11th century B.C.E. (Dothan, 1982:25-27).

Waldbaum, on the other hand, places level N in the 12th century, although she expresses some uncertainty of the date, Level M in the 11th century, and Level L in the 10th century (Waldbaum, 1978).[37] Level N appears to have been completely destroyed by fire. In regard to the presence of Philistine pottery at Tell es-Zuweyid, Dothan claims that, "although meagre, these finds indicate a Philistine presence at Tell es-Zuweyid, or at least its influence..." (1982:27).

Tell Jemmeh[38]

Tell Jemmeh, located in the western Negev, was the site of a flourishing city from the Middle Bronze Age II through the Hellenistic period. There is also evidence of a Chalcolithic occupation. The site is possibly ancient Yurza, a Canaanite city mentioned in Egyptian topographical lists of the New Kingdom and the el-Amarna letters.

There are difficulties connected with the first excavator's dating of the site, but the dates have subsequently been revised by van Beek (Amiran and van Beek, 1976:546). Level JK has been assigned to a period covering the 12th to 11th centuries, and GH to the 10th century. An abundance of Philistine pottery (Iron IB) spanning all three phases was found in these two levels. A pottery kiln found at the site was clearly associated with 12th or 11th century B.C.E. Philistine pottery. There is evidence of conflagration between the periods of the Phase 1 and 2 Philistine pottery and that of the Phase 3 pottery.

Among the finds recovered from Level GH were two buildings that are probably of the four-room type and an oven associated with a large quantity of slag. Petrie originally identified this as an oven used for iron smelting. The slag seems to have been produced at temperatures above 1100 degrees C., but analysis failed to yield any traces of iron, so there is no sure proof of iron smelting at the site (Amiran and van Beek, 1976:546-47).

Tell Qasile[39]

Tell Qasile was a Philistine coastal town that covered an area of about fifteen-sixteen dunams. The city is unique because it was evidently founded and developed by the Philistines during the first half of the 12th century B.C.E. Other known Philistine cities were Canaanite before the 12th century B.C.E. (Dothan, 1982:57). The site is located in a fertile region on a ridge above the northern bank of the Yarkon River. The success of agriculture in the region is attested by grain pits, silos, presses, store rooms, storage jars, and agricultural implements. It also appears to have been a flourishing port city during the 11th century. The archaeological finds include remains of a bronze metal industry and several workshops.

Twelve strata of occupation have been identified, dating from the 12th century B.C.E. to Arab and Mameluk times. Strata XII to X (12th century B.C.E. to the beginning of the 10th century B.C.E.) yielded abundant Iron IB

materials and clear stratigraphic divisions. The earliest stratum (XII) revealed the presence of a relatively small population. Phase 1 Iron IB pottery was present and the local Canaanite tradition continued in plain household wares. The remains of Stratum XI indicate a significant increase in building activity, including fortifications, the presence of a metal industry, and a ceramic assemblage that is a continuation of Stratum XII. Stratum X is a post (or late) Philistine level characterized by the presence of Israelite cultural elements and evidence of trade (attested by foreign elements in some of the pottery). Typical of this stratum are houses of a rectangular three-room type that may have been the archetype of the later Israelite four-room house (Dothan, 1976:965). The presence of Iron IA culture in this stratum is attested in both architecture and pottery. Iron IB pottery is less abundant than in previous strata and is of the degenerative Phase 3 type typical of the period. Stratum X was destroyed by fire at the beginning of the 10th century B.C.E. Stratum IX reveals changes in the organization of the new city (10th century) and is poor in ceramic and small finds. There are several examples of the four-room house.

Three superimposed temples were found in Strata XII through X. The series of temples is the only known one of its kind that can be attributed to the Philistine culture.

Tell Qiri (Ha-Zore^{c}a)[40]

Tell Qiri is located on the eastern Carmel ridge on the slopes leading to the Jezreel Valley. There is evidence of continuous occupation at the site from the 12th or 11th century through the 8th and 7th centuries B.C.E. A small amount of Philistine (Iron IB) pottery has been recovered from late 12th century/early 11th century contexts, but the main material culture seems to be an extension of the Late Bronze Age II traditions also found at Megiddo.

Tell Zeror[41]

Tell Zeror is the westernmost of the ancient sites in the Sharon Valley region. Occupation at the site extended from Middle Bronze Age IIA to the Roman period. The city experienced its greatest period of prosperity in Middle Bronze Age IIA. It was not fortified in the Late Bronze Age (Stratum XII), but a metalworking industry is attested by the presence of smelting furnaces, crucibles, clay bellows' pipes, and copper slag. An "unusual" amount of Cypriot pottery was found in Stratum XII (Kochavi, 1978:1224). Two Iron Age I occupation phases follow the Late Bronze Age II destruction. The only signs of occupation discovered in the 12th to early 11th century stratum were a number of storage pits containing refuse such as animal bones of sheep, goats, and especially buffalo, pithoi (storage jars), and cooking pots "typical of the settlement of the Israelite tribes in the thirteenth-twelfth centuries B.C." (Kochavi, 1978:1225).

T. Dothan says that this was possibly an Israelite settlement of tents and huts (1982:69).

Stratum X (the Philistine phases--second half of the 11th century B.C.E. to the early 10th century B.C.E.) revealed a well-built brick fortress and pottery typical of the 11th century B.C.E. It has been suggested that this was a settlement of Sea Peoples, possibly the T-K-R (Kochavi, 1976:1225; Dothan, 1982:70).

In the cemetery northwest of the mound a number of multiple burials in stone cist tombs were uncovered. The rich funerary offerings in the burials included pottery (some of the Philistine type) and bronze vessels, bronze and iron weapons and jewelry, beads, and figurines.

Stratum IX (post-Philistine phase) yielded one example of a collared-rim jar and a number of the four-room type houses.

Timna^{c}[42]

A total of eleven Late Bronze Age/Iron Age I camps with clear signs of having been connected with metalworking were discovered in the Timna^{c} Valley (thirty km. north of the Gulf of Elath-Aqabah) along the Wadi ^{c}Arabah. The valley was evidently a major source of copper mined as far back as the Chalcolithic period. Iron Age I pottery found in the mined areas indicates that copper was exploited during that period.

In all of the areas excavated in the valley, three essentially different kinds of pottery are predominant: ordinary wheel-made pottery, Negev-type pottery, and pottery that has been called Midianite because it is identical to pottery found in the Hedjaz in northwest Arabia.

One of the campsites typical of those found is site 2, a smelting camp dated to the Ramesside period. Smelting activity is indicated by the presence of slag heaps, furnaces, workshops, copper ore, and stone-crushing tools. A large building complex at the site contained workshops, storage areas, and a large number of clay tuyéres. Layers of windblown sand indicate that it may have been occupied seasonally rather than year-round.

A cultic structure was uncovered near the industrial complex. Its remains included broken animal bones, ashes, pottery, and a row of five Maṣṣebahs with a large stone bowl, perhaps for libations, in front of them.

Seventy meters west of the actual smelting area, an oval-shaped tumulus with a "floor" of carefully laid flat stones on solid rock was found. A large number of sherds, some from Midianite ware, beads, several very small copper spatulas and needles, numerous perforated Red Sea shells and ostrich-egg shells, and the remains of metallurgical activities were found in association with the tumulus. On the "floor" itself were several goat horns, copper rings, two iron bracelets, and a large quantity of beads. Rothenberg

has suggested that this area is probably a *bamah*, or high place (1978:1190). "It seems that the small-scale metallurgical operations at area F were an integral part of the actual worship and that the Midianites were the worshippers" (1190).

Another cultic area, the Hathor sanctuary, is centrally located in the ancient mining and smelting area of Timna^{c}.

Evaluation of Iron Artifacts: Philistine vs. Non-Philistine

The division of sites into "Philistine" and "non-Philistine" has been determined by the amount of Iron IA and Iron IB pottery found in 12th, 11th, and 10th century levels, the geographical location of the sites, and, where applicable, references to the sites in the Israelite literature.

The Early Iron Age pottery type normally associated with the Iron IA material culture is the "collared-rim" storage jar. W. F. Albright proposed that these jars were the work of the early Israelite settlers in Palestine. Subsequent scholars have supported and adopted this view (Ibrahim, 1978: 117). The largest concentration of the collared-rim jar has been found in the hill country of Palestine, but its distribution also extends into East Jordan. A few examples have been recovered from coastal and southern sites (Ibrahim, 1978).

> The jar is typically ovoid rounded, but sometimes with cut-off base. The two handles are attached vertically above the middle of the body, joining the shoulder. The neck is very short and ends with a folded thickened rim....The shoulder is wide and slightly convex...most examples are covered with a flakey white or greenish slip on a reddish to dark brown ware. The core is grey or blackened in most cases. (Ibrahim, 1978:117)

No distinction has been made here between Canaanite and Israelite non-Philistine peoples because it is difficult to distinguish difference in the material remains.

The identification of Iron IB remains with the Philistines is based on the geographical and stratigraphic distribution of a unique type of pottery introduced into Palestine during the 12th century B.C.E. The geographical distribution and proposed date of the Philistine entrance into Palestine have been based primarily on the appearance of this type of pottery. The pottery type tends to be concentrated in the coastal plains and borders of the hill country and is found only sporadically in the hill country. Clay analysis has shown that Philistine pottery was manufactured in the coastal regions (Sanders, 1978:167).

Metopes enclosing stylized birds, friezes of spirals, and groups of interlocking semi-circles are the most characteristic elements of Philistine pottery (Kenyon, 1979:214).

> Philistine pottery is a large, homogeneous group of locally made ware painted in black and red usually on a white-slipped background. It is attributed to the Philistines on the basis of typology, stratigraphy, and geographical distribution.

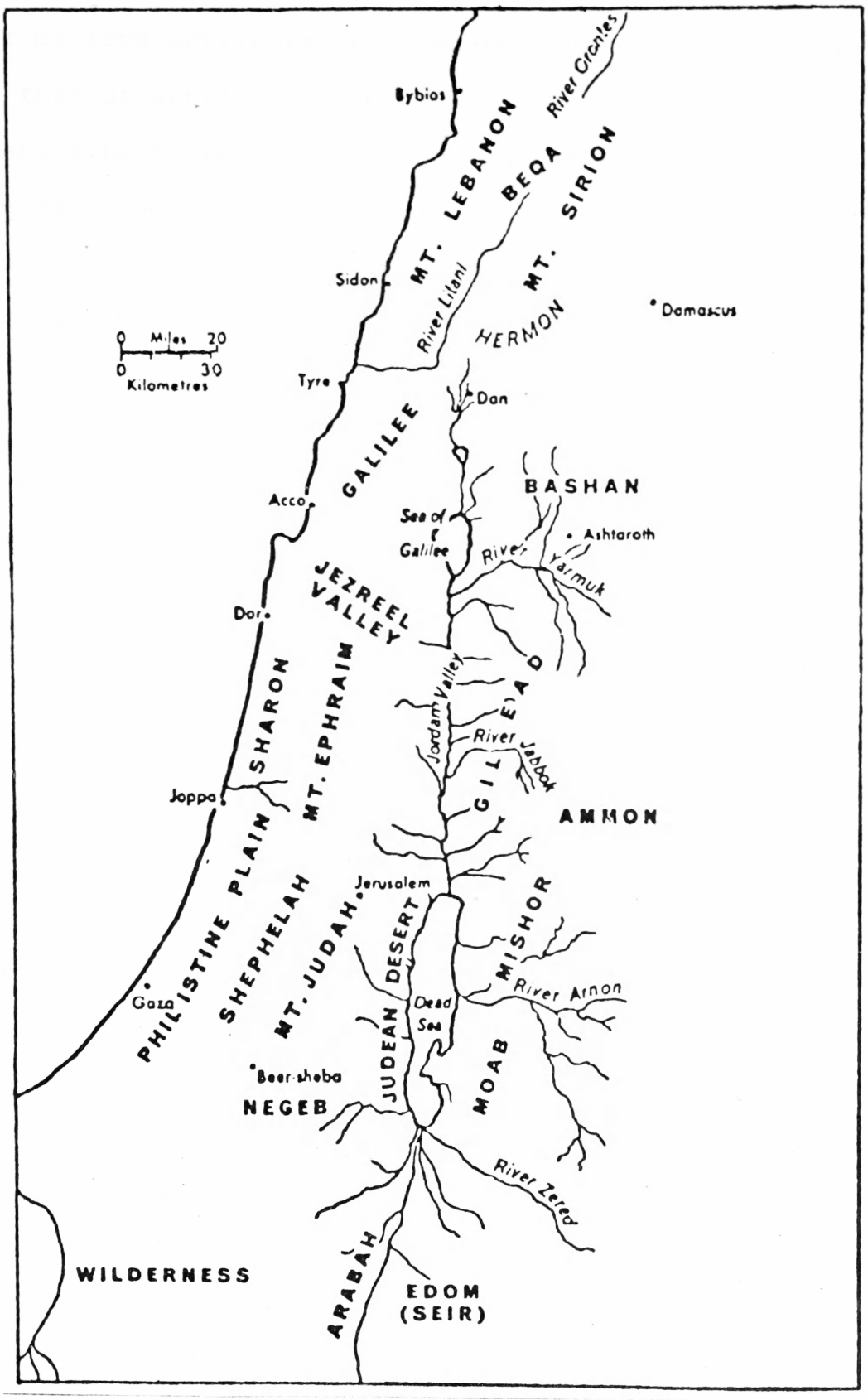
> Typologically, Philistine pottery reflects the Sea Peoples Aegean background, plus certain Cypriot, Egyptian, and local Canaanite elements. Geographically, it is found in the major Philistine cities, follows the spread of Philistine influence through Canaan, and diminishes as one moves away from Philistia.
>
> Stratigraphically, Philistine vessels appear in strata dated to the first half of the 12th and 11th centuries B.C. (Dothan, 1982:94)

The geographical divisions of "Philistine" and "non-Philistine" follow those usually attributing the coastal plains area (primarily the Philistine Plain, Sharon, and the southern portion of the Plain of Acco) to the Philistines, and the hill country, the northern plains area, including the Jezreel Valley (usually considered Canaanite), the southernmost regions, and Transjordan to "non-Philistine" peoples (Map 2).

Sites at which one or "a few" Philistine sherds have been found that lie outside of the region attributed to the Philistines are considered "non-Philistine" here. It is asserted that "a few" Philistine sherds does not necessarily constitute a Philistine presence.

Twelfth Century

The predominant metal found in 12th century B.C.E. levels of excavated sites in Palestine is bronze (Waldbaum, 1978:39). The total number of iron artifacts from 12th century B.C.E. levels is sixty-six (Table 13). From four Philistine sites (Table 6) come 13.6% of this total and from nine non-Philistine sites (Table 7) come 86.4%, i.e. the



Map 2. The Geographical Regions of Palestine.
*From Aharoni, 1979: 23.

number of iron artifacts from non-Philistine sites is six times that of artifacts from Philistine sites. The predominant type represented in both cultures is jewelry and ornamental objects (Tables 14 and 15). The average number of iron artifacts per site from non-Philistine sites is approximately three times that of artifacts from Philistine sites (Table 12).

It may be significant that in Philistine finds 100% of the iron artifacts occurred in burials and temples as opposed to 75% of non-Philistine finds (Tables 18 and 19).[43] In other words, iron has occurred in occupation levels only in non-Philistine sites.

A greater variety of types within the four categories of tools, weapons, jewelry, and miscellaneous types, also indicates the predominance of bronze in the 12th century B.C.E. (Waldbaum, 1978:40). Fourteen known types of bronze tools come from this period. Only one iron tool type has been found with Philistine remains. Six types made of iron have been found with non-Philistine remains (Table 16). Weapon types are also more numerous in bronze, with one type made of iron represented from Philistine sites and two from non-Philistine sites (Table 17).

If the Philistines had brought with them to Palestine the knowledge and practice of working iron, it would presumably be reflected in the material remains of their culture. The scant amount of artifacts from 12th century Philistine

sites does not indicate that the Philistines were experienced workers of iron.

It may be concluded on the basis of this material that archaeology does not attest to a possession of the "secrets" of ironworking by the Philistines. First, the raw count of iron artifacts and their distribution indicate that non-Philistine peoples of 12th century B.C.E. Palestine used iron more extensively than the Philistines. Second, non-Philistine sites have yielded a greater variety of potentially functional types of iron in the form of tools and weapons. And finally, the contexts of finds from Philistine sites point to a ceremonial or ritual function for the objects of iron, whereas there is at least a suggestion of utilitarian use by the Canaanites and Israelites.

Eleventh Century

In the 11th century levels there is an increase in iron artifacts throughout Palestine and in the number of sites in which they are found. There is also evidence of more emphasis on manufacturing utilitarian objects (Tables 14 and 15). Bronze, however, remains the predominant material, again in all categories (Waldbaum, 1978:39). The number of Philistine iron artifacts outnumbers that of non-Philistine artifacts, but not as much as might be expected if the Philistines did indeed have a monopoly on iron during the 11th century. Philistine sites yielded 57.5% of the total and non-Philistine sites yielded 42.5% (Table 13). The average number of

artifacts per site for Philistine and non-Philistine is 6.57 and 4.86 respectively (Table 12). From Philistine sites, 58.7% of the total come from tombs and temples, as opposed to 11.8% from non-Philistine sites (Tables 18 and 19). There is as well an increase in the ratio of tools and weapons, i.e. utilitarian objects, to jewelry and ornamental objects in both types of sites (Tables 14 and 15). The number of subtypes represented in the categories of tools and weapons also increases. Eight iron tool types are represented in non-Philistine sites and seven in Philistine sites (Table 16), compared to fourteen bronze tool types found in 11th century B.C.E. strata (Waldbaum, 1978:40). Bronze weapon types total seven. Three iron weapon types were found in Philistine sites and four were present in non-Philistine sites (Table 17).

In summary, the 11th century material indicates an increase in iron artifacts over the 12th century B.C.E. Iron from Philistine sites outnumbers that from non-Philistine sites, but the non-Philistine sites, as in the 12th century B.C.E., have yielded a greater variety of both tools and weapons. In addition, we may assume from the contextual evidence that iron maintained a more ritualistic or ceremonial function for the Philistines than it did for those groups composed of non-Philistine elements. Overall, the 11th century archaeological evidence does not support a claim of a technological monopoly of iron by the Philistines.

Tenth Century

From the 11th century B.C.E. to the 10th century B.C.E. the number of iron artifacts increases more than twofold (Table 13), and it is in this period that the number of iron utilitarian objects surpasses that of bronze (Waldbaum, 1978:39). There is a greater variety of weapon types, six types of iron vs. four types of bronze (Table 17), and the variety of iron tool types comes close to that of bronze (Table 16) with thirteen iron tool types and fifteen bronze (Waldbaum, 1978:40). By this time the advent of the "Iron Age" can be documented in the archaeological record.

Iron objects from non-Philistine sites far outnumber those from Philistine sites (Table 13), but the average numbers of artifacts per site are almost equivalent (Table 12). Although the number of objects from Philistine sites decreases from the 11th century B.C.E. to the 10th century B.C.E., this can be explained in part by Israelite occupation of areas previously under control of the Philistines. The substantial increase in both numbers of iron artifacts and the number of sites they are found in indicates that it is not just a shift in political dominance that affected the increased use of iron for producing utilitarian objects throughout Palestine. Iron resources and the necessary technology for producing iron must have been available to the Israelites and the Philistines in the 10th century B.C.E. This claim is supported by Stech-Wheeler et al.'s

study and analysis of iron objects from Ta^{c}anach (1981), where it was determined that a technological advancement in their manufacture, i.e. carburization, was evident. The study's results suggest that carburized iron was consistently produced in Northern Palestine by the end of the 10th century B.C.E. Complementary studies of 11th century iron objects from Philistine sites did not impart the same technological consistency. Technically and statistically, the Iron Age began when the Philistines were not in power.

The overall distribution patterns of iron artifacts from the 12th through the 10th centuries B.C.E. indicate a shift from technological superiority, if it can be called that at all in the 12th century B.C.E., by the non-Philistine groups in Palestine to a slight edge in terms of quantity, but not variety, of iron objects by the Philistines in the 11th century. The 10th century, as indicated above, is characterized by a vast increase in iron throughout Palestine.

The fact that bronze was the predominant metal for manufacturing utilitarian objects and the evident ceremonial and ritual use of iron by the Philistines suggests that during the period of conflict between the Philistines and Israelites iron was not relied upon as a necessary material for promoting military or political advantages. It was not until the 10th century B.C.E., when iron's use surpassed that of bronze, that iron played a significant role in the

political, military, and economic spheres of Iron Age Palestine. An iron monopoly on the part of the Philistines could not have been a factor in the threat they posed to the Israelites.

It seems that we must look further than the isolated passage in 1 Sam. 13:19-23 to discover the true role of the Philistines and iron in the biblical text. It is suggested here that the art of iron metalcraft and the traditions and symbols connected with it add further insight into the role that iron played in the emerging Age of Iron.

NOTES

[1]Prausnitz, 1975. The original site reports were not available to the present writer.

[2]Callaway, 1965, 1969, 1970a, 1970b, 1975, 1976.

[3]M. Dothan, 1971a, 1971b, 1973, 1979; T. Dothan, 1975, 1982:36-43.

[4]Ben-Tor, 1975; M. Dothan, 1961; T. Dothan, 1982:54-57.

[5]McGovern, 1981, 1982a, 1982b, 1982c.

[6]Kelso, 1968, 1975.

[7]T. Dothan, 1982:81-82; Geva, 1979; Ibrahim, 1978:121; James, 1966; James, et al., 1975; Muhly, 1982.

[8]T. Dothan, 1982:50-51; MacKenzie, 1912-1913; Wright, 1975.

[9]T. Dothan, 1982:44-48; Funk, 1958, 1975; Sellers, el al., 1968.

[10]Dever, 1976; T. Dothan, 1982:51-54; MacAlister, 1912.

[11]Albright, 1922, 1923; M. Dothan, 1955; Ibrahim, 1978: 121; Sinclair, 1960, 1964, 1976.

[12]Wright, 1955; Yadin, 1956, 1959, 1969, 1972, 1976.

[13]Aharoni, 1971; Callaway, 1975:38; Ibrahim, 1978:122.

[14]Haupert, 1939; Tufnell, 1977; Wright, 1955.

[15]Avi-Yonah, 1977; Harding, 1955.

[16]Aharoni, 1972; Albright, 1940; T. Dothan, 1982:70-80; Engberg, 1941; Loud, 1948; Rast, 1978:4; Wright, 1950; Yadin, 1977.

[17]But cf. T. Dothan (1982:70-76) where it is asserted that some of the Philistine ware originally attributed to VIA actually belongs with the assemblage from VIB.

[18]B. Mazar has suggested that the large structure this pottery was found in may have been used by a Philistine ruler in the last half of the 11th century (Yadin, 1977). But cf. Engberg (1941) who asserts that the presence of Philistine pottery is a product of normal commerce.

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[19]Yadin suggests that this destruction may have been a result of the Davidic conquest (1977:851).

[20]Glock, 1978; Lapp, 1964, 1969; Rast, 1978; Stech-Wheeler et al., 1981.

[21]Anati, 1975; Hamilton, 1934; van Beek, 1955; Maisler (Mazar), 1951b; Rast, 1978:5.

[22]The chronology used here is that of Rast (1978).

[23]Department of Antiquities, 1968; Dothan, 1982:44.

[24]The analysis of this assemblage indicates that the Philistine vessels were brought in from the coastal region of Philistia proper (T. Dothan, 1982:44 n. 119).

[25]T. Dothan, 1982:35; Kempinski, 1974; Tufnell, 1975.

[26]Albright, 1928, 1932, 1943; T. Dothan, 1982:43-44; Rast, 1978:4.

[27]de Vaux, 1976. Original reports were not available to the present writer.

[28]T. Dothan, 1982:27-33; Waldbaum, 1966; Yisraeli, 1978.

[29]Burials in such coffins appear to be derived from Egyptian practice and taken over by the Philistines (Waldbaum, 1976).

[30]T. Dothan claims that this tomb was "erroneously termed Philistine." The vessel originally called "Philistine" was Cypriot incised pottery (1982:33).

[31]The pottery represented in this tomb is end of Phase 2/ beginning of Phase 3 and represents a degeneration of motifs (Dothan, 1982:32).

[32]Broshi, 1977; T. Dothan, 1982:54; Ibrahim, 1978:121; Wright, 1947.

[33]Pritchard, 1977. Other sources were not available to the present writer.

[34]T. Dothan, 1982:87; Oren, 1978.

[35]T. Dothan, 1982:25-27. Other sources were not available to the present writer.

NOTES--Continued

[36]Dothan (1982:26) and Waldbaum's (1978:24) claims differ concerning the presence of Philistine pottery in Level N. Waldbaum claims that there were no Philistine remains in Level N.

[37]The same source is cited by both Dothan and Waldbaum.

[38]Amiran and van Beek, 1976; Dothan, 1982;33-35; Stech-Wheeler et al., 1981.

[39]T. Dothan, 1982:57-67; Dothan and Mazar, 1978; Maisler (Mazar), 1951a; Mazar, 1973; 1975.

[40]Ben-Tor, 1975b, 1976; T. Dothan, 1982:90.

[41]T. Dothan, 1982:69-70; Ibrahim, 1978:121; Kochavi, 1978.

[42]Rothenberg, 1978. The original reports were not available to the present writer.

[43]The statistics here are not reliable, because thirty-five of the fifty-seven iron objects from non-Philistine sites are from one site (the Baʿqah Valley in Jordan), and because the number of artifacts from Philistine sites is so low that the figures must be considered random.

CHAPTER III

IRON METALCRAFT AS TRADITION AND ART IN ANCIENT PALESTINE

Ancient metal technology is beginning to be studied as a tradition and as an art. It is asserted here that information from studies on traditional art and symbolism, archaeology, and ethnography can be consulted and integrated in order to reconstruct the traditions of ironworking in ancient Israel. "Traditions" here refers to the craft, skill, symbolism, and art employed by the ancient metallurgists. Literary traditions are not discarded, but the emphasis here is on the social dimensions of manufacturing.

History attests to the impact that a new technology has upon the economic, political, religious, and social aspects of a culture. In our own age, computer technology and nuclear energy offer clear examples. For antiquity, James Harrod's study on the mythic implications of the bow have demonstrated that ancient technologies cannot be divorced from the roles of religion, art, psychology, and philosophy in ancient society (Harrod, 1981). For a later era, the alchemists of the Middle Ages offer still another example to justify our claim (Eliade, 1978). The impact of technology on cultures, ancient and modern, is obvious to modern

historians who label past cultures the "Bronze Age" or "Iron Age" just as they identify modern periods as "computer age" or "nuclear age."

We are not the first to attach such labels to historical periods. Ancient philosophers, historians, and scribes did the same. A sequence of metal ages is mentioned in the Old Testament (Dan. 2:31-45), the Avesta, Buddhist literature, and by Greek poets and philosophers. In most instances, the metal named in the texts symbolized a quality or attribute of a time period. Although each metal mentioned in the dream reported in the Daniel passage was identified with a part of the human body, Daniel interpreted the dream to apply to Palestine's plight at the hands of foreign rulers. Gold was identified with the head, silver with the breast and arms, bronze with the belly and thighs, iron with the legs, and finally iron and clay with the feet (Dan. 2:32-35). Daniel associated the gold with the power and glory of Nebuchadnezzar, an inferior stage with silver, then bronze, and finally iron. He described the last as a kingdom "as strong as iron, because iron breaks to pieces and shatters all things; and like iron which crushes, it shall break and shatter all these" (Dan.22:40). This was, of course, the Seleucids and Ptolemies. In the next few verses, the division of Israel under these powers is depicted as a shattering of the feet of iron and clay (vss. 42-43). Although commentators apply the text to a later period, a similar application

could be made to Israel during the Early Iron Age, the period of our concern.

Symbolic and mythic significance of iron technology has a long history. Technology is the central theme of many myths where, in addition to the technology explicitly discussed, it is used as a symbol for understanding self and society. The Bronze Age texts cited above reveal that meteorites were the primary source of iron during that period. Because of its sacred celestial qualities, the "black iron from heaven" often took the form of omens and messages from the gods (Bjorkman, 1973:).

A similar celestial symbolism of iron is manifested in cultures throughout the world. Among the Rwala Bedouin in Northern Arabia, falling meteorites evoke both fear and reverence and occasion an elaborate ritual (Musil, 1928:6-7, 275). Although they fear that a falling meteorite will crush anything in its path, when the Rwala witness the fall and recover the meteorite, they bury it and a year later take it to a blacksmith to be made into a sword. A sword made from such a meteorite sells for a very high price and is believed to make its bearer invincible. The famous Kaaba, the black stone at Mecca, is another example of the great reverance shown meteoric iron.

In antiquity the advent of intentionally carburized iron changed the symbology of iron considerably. When the primary source of iron shifted from meteoric to terrestrial, iron's

symbolism shifted accordingly. Symbols connected with the earth became the norm, either replacing or taking their place alongside those connected with the heavens.

This shift was simultaneously reflected in the symbology of tools and weapons necessary for survival. When consciously carburized, iron became a useful metal and thus began to play an important role in day-to-day existence. Symbolic and ritualistic usage continued, but they changed in accordance with the function of iron. People came to depend on iron for food, shelter, and protection. But this dependence was not on iron as a raw material. It was iron transformed by a smith who took what was potential in the substance and made it actual by giving it the form of tool or weapon.

As stated above, the iron stage in the history of metallurgy involved the discovery and mastery of a new complex of processes and treatments. The understanding and conscious practice of carburization, necessary for transforming iron into a strong metal, was a prerequisite to regarding iron as a metal superior to bronze for utilitarian usage. Once this process was understood, the door was opened to a new age of technology.

This process's complexity would necessarily give the smith a prestigious position in a society economically dependent upon iron. Ethnographic studies have proven that the smith in primitive society is either honored or despised, but always held in awe. The usual pattern is for him to be

honored among agriculturists and despised among nomadic peoples.

Among the Rwala Bedouin of Northern Arabia, blacksmiths form clans of their own and are not fully integrated into the tribes with whom they live. They are considered outsiders. They never take part in the tribal raids, and they protect other smiths' interests in intertribal conflicts. As outsiders, they are not allowed to intermarry with the Bedouin (Musil, 1928:281-82).

Among villagers, on the other hand, the smith is often a counselor and sometimes chief or priest. He is looked upon as a wise and clever man who is an important go-between and trader. The ironsmith is held in particularly high esteem because it is he who forges the weapons and implements that are necessary for survival (Forbes, 1964:69).

The smiths' craft-traditions are the result of long experience and many experiments. Thus, the proficiency of the trade is acquired by generations of practice and discipline and are usually handed down from generation to generation. Among agriculturalists, smiths are normally organized in guilds and their trade is recorded in long genealogies.

A rigid system of ethics controls the guilds, and pupils must be initiated. Trade secrets are jealously guarded. The work of the smith is bounded by traditional rites and ceremonies. The religiosity is implied in Titus Burckhardt's assertion that craftsmen imitate the formation of cosmos out

of chaos (1967:45). Working the metal must be undertaken in a state of ritual purity, and practically every operation must be carefully regulated, accompanied by specific offerings and ceremonies. The fire in particular must be kept pure, for that is where the power of the smith originates.

The smith is also an important and revered personage in ancient myths. Both he and the implement he manufactures are stressed. One example is an Egyptian myth where the god Ptah in the role of smith assisted Horus in defeating Seth by forging Horus' arms.

In many societies, considerable power is ascribed to the smith's tools, particularly the hammer, the anvil, and the furnace. Often tools are ascribed divine attributes and great care must be taken when handling them or during an initiation (Burckhardt, 1967:45). The smithy also plays an important role and can be viewed as a ritual center or temple where the smith is priest and the furnace is an altar upon which the rites are enacted.

The most powerful symbols, however, are related to the metal itself and the miraculous transformations that attend its manufacture. The power of terrestrial iron is often ascribed to its connection with the earth. Meteoric iron also manifests the power of the realm from which it sprang. All metals acquire additional power through their purification by fire.

But with metal, like other substances, form gives meaning (Nasr, 1981:267). The material is intelligible, states Burckhardt, only by virtue of its form, and form is measurable only through its combination with material (1967:56). The most important forms given to iron are those of tools and weapons. Mircea Eliade says of the symbolism surrounding tools and weapons:

> Contrary to what might be called "cosmic" symbols--stars, waters, the seasons, vegetation, etc.--which reveal both the structures of the universe and the human mode of being in the world, the symbolism of tools and weapons disclose specific existential situations. (1978:463)

Eliade's statement corresponds to evidence from the ancient Near East. Most of the earliest iron objects from that region are made from meteoric iron and are found in contexts that suggest ritual use: tombs, graves, and temples. In most cases they are ornamental artifacts containing gold and other precious metals. Finds that do not appear to be ornamental, i.e. tools and weapons, are assumed to have served ceremonial rather than utilitarian function.

Iron seems to have been treated as a precious material limited to use by kings and other prominent people. It was probably rare and difficult to work. The texts cited above in Chapter I also attest to the precious nature of iron in the ancient Near East.

The paucity of archaeological and textual evidence for iron prior to the Early Iron Age indicates that the metal was

not used so widely that it had meaning for the average person. Rather, iron was primarily used as an indicator of wealth and status, and perhaps of connection with the gods.

The archaeological record indicates that from the 12th century B.C.E. forward, iron's use in manufacturing functional and utilitarian objects began to increase and that by the 10th century B.C.E. it had replaced bronze as the preferred metal. It's appearance in occupation levels and working areas also increased significantly.

Excavations in Israel have identified a number of structures as metalworking installations. None of these can be associated conclusively with the manufacture of iron, but nevertheless they shed light on the art of metalcraft in ancient Israel. Two discoveries are of particular interest for the present study.

The first is the building identified as a "cultic structure" at the Canaanite and Israelite site of Taanach in northern Israel (Stech-Wheeler et al., 1981). In addition to a number of artifacts that have been called "cultic," numerous iron artifacts and materials connected with metalworking were found. These included tuyéres, a broken copper tool, copper spillage that may have resulted from smelting and casting operations, and two unfinished iron objects.

The evidence suggests that some kind of metallurgic activity occurred there under religious auspices, and that the metal objects were a collection of broken and damaged

items placed there to be repaired later by a craftsman associated with the cult. Many of the iron objects dating to the 10th century B.C.E. at Taanach indicate that iron was being consciously carburized by that time.

Another archaeological area that has illumined metal-working in ancient Israel is the Timnah Valley along the Wadi Arabah (Rothenberg, 1978:1184-1203). Eleven camps exhibit clear signs of smelting. One, typical of others, had slag heaps, furnaces, workshops, copper ore, stone crushing tools, and clay tuyeres. The presence of layers of windblown sand at the site indicate that it may have been occupied seasonally rather than year-round. A similar claim has been made for Deir Alla in the Jordan Valley (Franken, 1969), an interpretation which although controversial deserves further scrutiny.

At Timnah, a structure identified as cultic was uncovered near the industrial complex at the camp. Its remains included broken animal bones, ashes, pottery, and a row of five maṣṣebah with a large stone bowl in front of them, perhaps for libations.

Seventy meters west of the actual smelting area, there was found an oval-shaped tumulus with a "floor" of flat stones carefully laid on solid rock. Among the artifacts recovered was evidence of metallurgic activities. It has been suggested that the area was probably a bamah, or high place, at which the Midianites worshipped. The association

of metalworking with a cultic setting makes it plausible to suggest that worship was an integral part of the metallurgic operations at the site. The identification with Midianites can be inferred on the basis of a large quantity of pottery identical to that found in the Hejaz of northwest Arabia, the area commonly associated with biblical Midian.

Against this background, several biblical passages take on greater meaning. Jethro, the father of Moses' wife, is identified as a priest of Midian in Exodus 3, but is called a Kenite in Judg. 1:16, as is Moses' wife's brother in Judg. 4:11. The confusion of Kenite with Midianite may be explained by the ethnographical example of the Rwala Bedouin cited above. Like the metalworkers among them, the Kenites may have been a group of people who were living amongst the Midianites but were not full members of the Midianite tribes.

The Kenites have often been identified as wandering smiths. In 1 Chr. 2:55 they are related to the Rechabites, who in Jer. 35:6-10 are depicted as wandering tent dwellers known for their strict regulations regarding habitation and abstinence from wine. Further evidence for an identification of the Kenites as wandering smiths is the semantic similarity of their name קֵינִי, "Kenite," or הַקֵּינִי, "the Kenites," to Syriac qaynāyā', Palmyrene קינאא, and Targumic קֵנָאָה, and the Arabic for "worker in iron." In addition, תּוּבַל קַיִן son of קַיִן in Gen. 4:22 is called the ancestor of all who לֹטֵשׁ כָּל חֹרֵשׁ נְחֹשֶׁת וּבַרְזֶל "are hammerers and engravers of bronze and iron."

In 1 Sam. 15:6 the Kenites are portrayed as friends to the Israelites because of their kindness to them during the Exodus from Egypt.

The biblical portrayal of the Kenites as a wandering group of peoples, the reference to Jethro as a priest, and the similarity of their tribal name to that of "workers of iron and bronze," along with the archaeological evidence for an association of religious cult with metalworking at Timnah, Taanach, and Deir Alla parallels what we know of the practices of blacksmithing in primitive tribal societies. And the symbolic nature of iron tools and weapons also fits well with the views of Eliade and others who hold that the symbolism of tools and weapons "disclose specific existential situations."

In the Israelite situation, iron's miraculous transformation through smelting and forging inspired awe. These processes changed the soft ore to a metal of superior strength. Because the conscious practice of carburization began in the 10th century B.C.E., the Hebrew scribes were aware of the extraordinary properties resulting from these changes. These would certainly have had an impact on their perception of the world. In their writings, iron took on complex meaning. It served as prism and lens, i.e. a symbol, gathering Israel's knowledge, feelings, and experience of the past and of this process, in order to focus upon and tell about specific historical episodes, describing them in language that those who used iron would understand.

In almost every instance, references to iron in the Hebrew scriptures indicate that iron was greatly feared, respected, and desired for its power and strength, especially in the form of weapons and tools. The ambivalence of the symbol is evident. In certain instances iron symbolized the threatening strength of Yahweh. For example, Deut. 28:47-48 reads: "Because you did not serve the Lord your God with joyfulness and gladness of heart,...you shall serve your enemies...and he will put a yoke of iron upon your neck until he has destroyed you." Elsewhere explicit taboos against the use of iron, common among tribal societies, are found. Deut. 27:5, Josh. 8:31, and 1 Kgs. 6:7 warn that iron tools must not be employed in building the altar of Yahweh.

But iron also had positive and desirable qualities. It was "into a good land, a land of brooks and water...in which you will lack nothing, a land whose stones are iron..." that Yahweh led his people (Deut. 8:9). In Deut. 33:25, iron is used metaphorically along with bronze to indicate the desirability of strength. Moses blesses the sons of Asher saying: "Your bars shall be iron and bronze: and as your day, so shall your strength be."

The association of chariots with iron in the Bible is particularly interesting and is important for understanding how symbols function in the Israelite literature. Iron chariots are referred to five times (Josh. 17:16, 17:18; Judg. 1:19, and Judg. 4:3, 13). Each links iron chariots

to the Canaanite military advantage over the Israelites during the so-called "conquest" of Canaan.

For the biblical authors, chariots in the pre-monarchic period always symbolized a power outside of Israel and one that was threatening. At one time or another, the Egyptians, Canaanites, and Philistines each enjoyed a military advantage over the Israelites of the hill country for whom chariots were impractical. The Bible repeatedly emphasizes that the Israelites were unable to take the cities of the plains because their armies did not have chariots or "chariots of iron" as did both the Philistines and Canaanites.

Chariots, of course, would have actually been made of wood, and the strength of iron was probably not yet fully perceived because it was not consciously carburized in this period. By the 10th century B.C.E., however, iron fittings for chariots are attested. An iron ring found at Taanach is thought to have belonged to a chariot (Stech-Wheeler et al., 1981).

The association of iron with chariots made iron a vehicle for symbolizing a military, economic, and technological ascendency of groups possessing iron. The tenor "chariots of iron" encompassed the Israelite's perceptions of iron, their perceptions of chariots, and their perceptions of peoples who possessed chariots and supposedly iron. For the Israelites, "chariots of iron" belonged to peoples who had centralized governments, well-trained armies, and kings. These

were enemies who lived outside the hill country, peoples who had been a threat to the very existence of the Israelite community.

The iron chariots also symbolized the differences separating the Israelites from the Canaanites and Philistines. Israel seems to have prided herself on her lack of chariots and feared the day when she might possess her own. Samuel warned the people that choosing kings would bring chariots to the nation (1 Sam. 8:11-12). Therefore, chariots functioned symbolically to underscore the cultural differences among Israel and her enemies, as well as to emphasize the fact that Israel eventually proved herself and overcame her adversaries, even though they had possessed "chariots of iron."

When the biblical writers later recorded Israel's history, it was with intent. They intended for this history to be meaningful in the present and to bear meaning for the future. Naturally, they wrote down the events that had immediate impact on their situation in the present. They were concerned with both the past and the future as relevant to the present.

We must now state our hypothesis directly. By the time the biblical texts were written, iron was consciously carburized and acknowledged as a metal of superior strength. It is proposed that the knowledge of iron was translated into symbol and retrojected upon the past. The symbol was used to

tell about experiences and to bring the past and present into focus in a way that expressed the peoples' apprehensions about their existential situation. The scribes understood Israel's history and the nation's insecurity before enemies armed with superior weapons, tools, and even chariots. The boundaries between feelings and events became blurred, as did past and present, so that the dominance of former enemies was described and expressed by using the symbol, iron. Chariots also enriched the expression of Israel's subservience, and chariots of iron were created to explain the past and to demonstrate that Israel's strength was not rooted in a substance as mundane as iron.

Many questions remain, about the geographical location of the Kenites when there were "no smiths to be found in all the land of Israel," about the source of the iron, and about the reasons why ancient and modern commentators have taken the Samuel passage literally. But the available archaeological and anthropological evidence has contributed significantly to our understanding of the art and technology. Metalworking in ancient Israel had many facets. These sciences have given us a glimpse of the impact metal technology had on the peoples of the ancient world and their religious writing.

CHAPTER IV

CONCLUSIONS

Throughout this study a number of conclusions pertaining to specific literary, historical, and archaeological questions have been drawn. Each has broad implications for reconstructing the history and culture of the early Iron Age. But most of the conclusions have had to remain tentative. Rather than resolving questions, they brought particular historical issues into focus, such as the question of Philistine versus Israelite dominance in Iron Age I, the Philistine's role in introducing iron technology into Palestine, and the meaning of a biblical passage which, according to many biblical scholars, attributes an iron monopoly to the Philistines when the archaeological record suggests otherwise. In each case, caution has been dictated by the fact that neither occasional literary references nor isolated archaeological discoveries are conclusive evidence for economic or political dominance, for a particular type of social organization, or for the ethnic identity of population groups.

Although the study has concentrated upon specific questions in a single historical period, the issues that have been raised are far-reaching. In fact, one would expect them

to arise in any study of ancient Palestine which depends upon literary and archaeological records. The problems we have faced when interpreting those records need recognition before solutions can be expected. Historical reconstructions like our regional study of iron technology in Iron Age Palestine depend on excavations and excavation reports completed before archaeology in the region had reached maturity. Any study that is forced to rely heavily upon such research faces problems. In the first place, the sites excavated by early archaeologists were not always the type that would be chosen today, and yet, they may be the only ones reported and published. Sites were sometimes excavated only because they were mentioned in the Bible or because museum-quality artifacts and architecture were thought to be present. As a result, urban centers received the greatest attention, usually fortified cities that figured prominently in the biblical record.

The concern for the Bible that motivated archaeologists during the early days of their science also focused attention upon a restricted geographical area and caused the wider region that could have offered a context for events in biblical Israel to be ignored. Although biblical interests were not the only cause for this parochialism, they contributed to the neglect of other important areas. Transjordan, a region important for our study, is an example. One can only guess whether a discovery such as the collection of thirty-five

pieces of iron jewelry found in a 12th century burial cave in the Baqᶜah Valley (McGovern, 1982) would not have been found earlier if sufficient interest had been shown that area. If it had, assumptions about Philistine dominance and the introduction of iron technology might have varied dramatically.

Although it would be wrong to judge previous generations by the standards of today, one cannot fail to observe that earlier archaeological techniques have left us with as many questions as answers. Here a second reason for the tentative nature of our conclusions comes to the fore. The lack of precision in and controls over the recording of stratigraphy in early excavations is a serious handicap. At Gezer, for example, MacAlister excavated more than three-fifths of the mound but failed to observe more than eight of the twenty-six strata since recorded, and some of his datings were wrong by as much as 800 years. In addition, many of the objects and sherds from the first excavations were recorded but not published in relation to context (Dever, 1980:42).

The lack of attention to stratification and dating in the early excavations have caused historians to overlook important cultural shifts especially the more gradual and subtle. For example, material that is identified simply as "Iron Age I" or "Iron Age II" in Kelso's report on Bethel (1968) make it impossible to determine the number and nature of cultural shifts that occurred during several hundred years.

To draw firm conclusions in a study such as our own, strata and phases within Iron I must be identified.

Perhaps the most serious criticism that can be levelled at archaeologists is not the nature of early techniques, methods, and reporting, but their failure to publish their findings completely. And this is not a charge reserved for past generations. The failure to publish findings seems to be endemic among archaeologists, and this has serious ramifications for scholarship generally. Studies such as our own depend on archaeological reports, and our success hinges on a complete listing of artifacts recovered. It is sufficiently difficult to reconstruct technology as a factor in cultural process when all items have been recorded and published; it is doubly difficult when such records are lacking. Sound research design would insure that pertinent information was not ignored during excavations, but no design can compensate for the inaccessibility of unpublished data.

There is also a need to re-evaluate the identification of particular ethnic groups with pottery and architectural types. Linking ethnicity to typology directly influences the conclusions about the relationships among several groups of peoples. For the present study, Canaanite, Israelite, and Philistine peoples are distinguished in the literature, but they are not so easily distinguished in archaeological remains. The Canaanite and Israelite material cultures are especially difficult to separate and may in fact be two

distinctive social organizations within the same culture, a point that Mendenhall's studies has made clear (1973).

Two recent studies of ancient Palestinian pottery types have raised these questions. The first is M. Ibrahim's study on the distribution of the collared-rim jar (1978); the second is P. Parr's study on the distribution of Nabataean pottery (1978). Ibrahim's survey indicates that the collared-rim jar has been found in sites outside of the region usually associated with the Israelites. On the basis of his analysis he concludes:

> The presence of the collared-rim jar during the late 13th-12th centuries cannot be attributed to one single ethnic group. The origin and the long use of the type under discussion, whenever and wherever, ought to be considered in connection with a social-economic tradition. (1978:124)

In the opening comments of his article on Nabataean pottery, Parr states:

> [It is] perhaps the single most important assumption in archaeological methodology that the movements and activities of specific groups of people can be distinguished in the archaeological record most readily and certainly from a study of ceramic typology. The assumption is undoubtedly correct in many instances; but at a time when archaeologists, both "new" and "old" are looking more closely than ever before into their methodology, and when improved laboratory techniques are making it possible to extract more physical data than ever before from potsherds, it will not come amiss to subject the assumption to scrutiny. (1978:203)

Parr's study proves that the distribution of Nabataean pottery is not co-terminus with the Nabataean cultural province

in either time or space (Parr, 1978:204). Temporally, the Nabataeans existed as a tribe for as much as 250 years before Nabataean pottery appeared and the pottery type continued to be popular well after the Nabataean kingdom was extinct and thus is "quite irrelevant to a study of the Nabataean polity" (204). The pottery's geographical distribution, on the other hand, did not even extend to the boundaries of Nabataean influence, but was confined to the central region of Nabataean control.

The two studies cited here suggest that conclusions of ethnicity based on archaeological remains must be embraced cautiously. The archaeological evidence contained in Iron Age I sites in Palestine suggests the same. The distribution of Philistine pottery, for example, does seem to correspond to temporal and geographical limits described in the biblical text for a group of Sea Peoples. Thus, there is strong evidence that a particular group of people in a particular geographical area of Palestine (the coastal region) manufactured pottery based on Mycenaean prototypes. A problem arises, however, when small amounts of Philistine pottery are found outside of the Philistine region, or when this pottery is found in combination with pottery or architectural types attributed to other "ethnic" groups. A Philistine influence, presence, or dominance, for example, has often been asserted on the basis of a few sherds (see, for example, Dothan, 1982: 81 on Beth Shean). Other sites, for example Megiddo, yielded

both "Philistine" and "Israelite" pottery types in Iron Age I strata. The question that arises is what amount of pottery must occur at a site in order to conclude the dominance of one group over another?

The "Israelite" four-room house presents a similar dilemma. Its features are typical of Iron Age II architecture in Palestine, but the type begins to appear in Iron Age I levels at some sites. If the house is an Israelite innovation, then we must ask why it also occurs in association with Philistine pottery in the Philistine geographical region in Iron Age IB strata. Examples of structures similar in form to the four-room house have been found in 11th century strata at Tell Qasile, Tell esh-Shari^{c}a, and Tell Jemmeh, all judged to be Philistine sites.

It seems that we must follow Ibrahim and Parr's lead in subjecting ethnic assumptions to further scrutiny. We might also apply proposals such as G. E. Mendenhall's that the Philistines, Israelites, and Canaanites were not ethnically distinct peoples. Rather, they were new social organizations of the existing population groups with differing value systems (1973:153).

There is one problem affecting the present study that archaeologists cannot resolve. That is the condition and preservation of the artifacts themselves. Because iron is a material that tends to corrode easily, many iron artifacts have survived as mere "lumps" or unidentifiable fragments.

It is not possible to determine how many iron objects have disintegrated and left no trace for archaeologists to test or interpret. However, this forces us to get the most from the material that has survived and come to light through archaeological excavations. We must use the evidence that is available and supplement it with information from the literature and from other disciplines in order to reconstruct the historical and cultural implications of iron technology in ancient Palestine.

Better research designs currently being developed in Near Eastern archaeology will eliminate some of the problems encountered in this study. The methodologies employed in recent excavations are better suited for gathering the types of information needed for studies such as this. Projects are being deliberately designed with specific historical and cultural questions in mind, and regional studies are being carried out at sites smaller than those excavated in the past, and this is being done with less digging and more attention to analysis (Dever, 1980:47). Now, there is greater emphasis on defining cultural processes in Palestine's history, and the multidisciplinary approach stressed in the "new archaeology" of American archaeologists has become the norm. Excavators are employing computers and statistics for handling complex data and for detecting patterns that will prove to be useful in studies on distribution and cultural patterns. These tools will prove to be particularly useful for studies

such as that undertaken here that depend on statistics previously unavailable. Computers and statistical studies will be particularly useful for comparing quantities of artifacts to the area excavated to determine the densities of artifacts. Density studies will produce more precise information from which to draw comparisons.

This thesis has taken account of these problems and has proposed a method here for compensating for the paucity of evidence contained in the archaeological and literary records. We have applied evidence and techniques obtained from art, from the study of symbols, and from several subdisciplines within anthropology, namely, ritual studies and comparative ethnography. Ethnographic studies and studies on traditional art and symbolism add dimensions to the solid evidence we have and can supplement it by adding insights that would not be possible otherwise. Iron was certainly used in ancient Israel. That we know from archaeology and literature. But iron technology's impact on Palestine's culture and how that impact was felt and interpreted is difficult to determine without consulting living cultures. How technology affects them and how they adjust their lives and beliefs to incorporate technology in their daily lives and in their self-perceptions can be applied to the study of ancient cultures.

The solutions offered here are a small step toward a full understanding of culture in Early Iron Age Palestine. While they answer questions, the proposals have also brought

questions to the fore. Nevertheless, they do suggest a way in which archaeology and literature can be integrated to answer historical and cultural questions.

If sites are excavated more carefully and with sound research designs, excavations are published in a fashion that information can be extracted from them easily, and cross-disciplinary methods are employed in interpretation, cultural and historical questions will surely be better answered.

APPENDIX

ACHZIB

10th Century

Tools. A single iron artifact has been found at Achzib. An iron knife was found in a "warrior's tomb."[1]

^{C}AI (ET-TELL)

11th Century

All of the iron objects recovered at ^{C}Ai have been dated to the 11th century, and all come from occupation levels.

Tools. A single piece of iron bent into a shape identified as tweezers; three knives; a nail; and a tool fragment.

Weapons. Two lanceheads and a conical spearbutt.

Jewelry. Two bracelets.

Other. One unidentified fragment and a "rod" whose identification and date are doubtful.

ASHDOD

10th Century

A total of five iron artifacts have been found at Ashdod, all from 10th century contexts.

Tools. One "Aegean-type" iron knife was found in a stratum X burial (Dothan, 1982:42; Stech-Wheeler et al., 1981:257); one large blade/pick; and one axe (Stech-Wheeler et al., 1981:257).

Jewelry. One ring, location and context unidentified.

Other. One fragment.

AZOR

12th Century

Jewelry. One iron bracelet was found in a child's burial (burial 56) at Azor. The burial is that of a child seven or eight years old. On the child's throat a unique scarab from the Nineteenth or Twentieth Dynasty was found.

Also found in the burial were a bronze mirror and Philistine (Iron IB) pottery. Dothan identifies the burial as a "plain burial," the most common type found at the site. The body in this type of burial is laid on its back in an east-west orientation. The funerary equipment consists primarily of typical Philistine pottery.

BAQ^{C}AH VALLEY (JORDAN)

12th Century

A total of eleven intact iron objects and forty fragments of another twenty-four such artifacts come from burial cave A4, dated to the earliest part of the Iron Age (ca. 1200-1040 B.C.E.).

Jewelry. All of the objects are jewelry. The intact objects consist of eight iron bracelets and three iron rings. Five of the bracelets were tested for carbon content, and the results proved that four of these were carburized, verifying the earliest instances of mild steel from Jordan.

The burial cave contained the remains of 220 individuals. Males, females, and children were represented. Associated artifacts included: a unique assembly of seventy-eight Iron Age IA whole vessels; bronze anklets and bracelets, earrings, and rings; beads of a wide assortment of types and materials; toggle pins; buttons; one pendant; one scarab; one stamp seal; and one cylinder seal. The cave contained no weapons of either bronze or iron. The faunal remains consisted of sheep, goat, dog, and various species of terrestrial mollusks.

BETHEL

10th Century

A total of eleven iron objects from definite Iron Age I levels have been found at Bethel (Kelso, 1968). All eleven artifacts have been assigned to the 10th century here since the reports do not indicate what levels they came from aside from "Iron Age I." All artifacts were listed in the report without regard to context.

Tools. Three narrow iron pieces, each about 6 cm. in length described by the excavator as possible tool points (Kelso, 1968:85); and an iron hammer.

Weapons. Four iron arrowheads; and an iron javelin point.

Jewelry. An iron fragment "probably from an iron ring" (Kelso, 1968:90).

Other. An iron fragment 6 cm. in length.

BETH SHEAN

12th Century

Tools. Three iron nails come from Level VI. One of the nails is described as a large spike with a small head.

Weapons. Five fragments of an iron dagger were recovered from Level VI.

Jewelry. One ring was found in a tomb in the northern cemetery. The clay coffins from Beth Shean are associated with this cemetery.

Other. From Level VI are: a round knob pierced with a hole (possibly intrusive); a fragment (of a tool or weapon?); and fragments of iron adhering to a mass of bronze (sealed below late Level VI walls).

10th Century

All 10th century iron objects come from lower Level V at Beth Shean.

Tools. Four knives.

Weapons. A fragment of a weapon (unidentified).

Other. Four unidentified fragments.

BETH SHEMESH

11th Century

Iron artifacts from Stratum III at Beth Shemesh (11th century) include:

Tools. A chisel; a curved knive; a tool fragment; and a sickle.

Other. A fragment with bronze rivets.

10th Century

Iron objects from 10th century contexts come from Strata IIa and IIb, and Tomb 1. Tomb 1 is a natural burial cave located in a cemetery north of the city, and was evidently used for many generations (MacKenzie, 1912-1913:53).

Tools. One ploughshare from Stratum IIa and one from Stratum IIb.

Weapons. Three arrowheads from Tomb 1.

Jewelry. Two bracelets, rusted together, from Stratum IIa; and one bracelet from Tomb 1.

BETH ZUR

11th Century

One example of iron comes from an 11th century context at Beth Zur.

Jewelry. One iron toggle pin.

GEZER

11th Century

Tools. From Tomb 58 come one iron knife with three bronze rivets and one of two iron rivets from a bronze bucket handle. The tomb was used during three different periods: Late Bronze Age II, Iron Age I, and the Hellenistic period. A meagre assemblage of Phase II Philistine pottery (11th century) belongs to the Iron I phase of the tombs' use (Dothan, 1982:52-53).

Other. From Tomb 59 comes an iron bar of uncertain purpose. The tomb was used from the Late Bronze Age to the 10th century B.C.E. A diverse collection of Philistine pottery, mostly Phase II (11th century) but a few examples of Phase I, were recovered from this tomb (Dothan, 1982, 1982:53).

10th Century

A total of twenty-one iron objects have been assigned a 10th century date.

Tools. Six knives were found, one in Tomb 31, one in Tomb 85 (possibly a clever), two in Tomb 96, and two in Field II. Tomb 84-85 was used from the Late Bronze Age II

to Iron Age I-II. It contained a small amount of Philistine pottery lacking clear context, and a group of cultic vessels datable by a cartouch of Rameses III (Dothan, 1982: 53). "Several" nail fragments come from Tomb 84-85. Two iron tool fragments and another tool fragment come from Fields III and II respectively.

Weapons. A total of five iron arrowheads come from Fields II and III, three from Field III and two from Field II.

Jewelry. Two iron bracelets were found in Tomb 96 and one ring in Field III.

Other. Miscellaneous iron objects from 10th century Gezer include an iron fragment, possibly from a vessel, a cylindrical iron rod with fragments of a bronze sheet wrapped around it, and a "disc" from Field III.

GIBEAH (TELL EL-FUL)

11th Century

Tools. A single Iron plough point comes from the fortress proper at Gibeah.

HAR ADIR[2]

12th Century

An iron pick was found at Har Adir (unpublished) near Sasa in the upper Galilee in northern Israel. The pick was associated with 12th century pottery reflecting a connection with Cyprus. Tests have proven that the pick is made of quench-hardened steel with a hardness similar to that of modern steel.

HAZOR

10th Century

Tools. One small riveted knife comes from Stratum X at Hazor.

KHIRBET RADDANA

11th Century

Tools. Two iron tools come from 11th century contexts

at Khirbet Raddana, a tool point and a knife.

Other. One iron "rod" comes from an 11th century context.

LACHISH (TELL ED-DUWEIR)

10th Century

All of the Iron Age I iron objects recovered at Lachish have been assigned to the 10th century B.C.E. (Level V).

Tools. A total of six iron tools come from Lachish: a knife with iron rivets from Level V; a knife from Tomb 16; three knives--two with iron rivets--from Tomb 521; and one trident or pitchfork, also from Tomb 521.

Weapons. Two armor scales come from Level V at Lachish.

Jewelry. A fragment of an iron bracelet and a plain arched fibula were recovered from Tombs 218 and 283 respectively.

MADEBA

12th Century

Jewelry. A total of four pieces of iron jewelry were recovered from the tomb at Madeba; a bracelet with a plain closed band, a plain bracelet with open ends, and two rings, one with open ends and one with closed ends.

MEGIDDO

12th Century

Tools. One iron hook comes from Stratum VIIA.

Jewelry. One iron ring comes from Stratum VIIA.

11th Century

Tools. A total of seven iron tools come from 11th century contexts at Megiddo: five knives, four from Stratum VI and one from Tomb 39; a needle from Stratum VI; and a staple, also from VI.

Weapons. One iron dagger that had been "killed"

(twisted out of shape) comes from Tomb 1101B.

Jewelry. Four pieces of iron jewelry come from 11th century contexts: one ring with an iron core covered with gold from Tomb 39; and three bracelets, one from Tomb 221b and two from a hoard found in Level VIA.

10th Century[3]

Tools. Nine tools come from 10th century Megiddo: three knives, one with bronze rivets in the haft, one with iron rivets, and one with no rivets, all from Stratum V; a borer (or awl) with a bone handle from Stratum V; a tool fragment in a bone handle from Stratum V; two socketed axes from Stratum VA-IVB; a sickle from Stratum VA-IVB; and a tool fragment, also from VA-IVB.

Weapons. A total of twenty-two iron weapons are dated to the 10th century: twenty-one arrowheads, fourteen from Stratum V and seven from VA-IVB; and one armor scale from Stratum V.

Jewelry. Two iron bracelets were found, one in Stratum VA-IVB, and one on the arm of an infant in Tomb 37B.

TA^{C}ANACH

11th Century

Tools. One chisel dated to approximately the 11th century comes from the Cultic Structure. Tests showed no evidence of carburization.

10th Century

Tools. Eleven iron tools come from 10th century contexts at Ta^{C}anach: two ploughshares, one from the cultic basin that was deliberately carburized (Stech-Wheeler et al., 1981:253), a sickle or scythe fragment for which there is good evidence for carburization (253)[4]; a sickle; a ploughpoint; a carburized blade, probably from a goad and two unfinished, carburized objects, one a blade and one perhaps an incipient axehead (252).

Weapons. Four iron weapons have been found in 10th century contexts at Ta^{C}anach: an arrowhead for which there is no evidence of carburization; fragments of a sword blade (slightly carburized)[5]; and two armor scales, one carburized, and one for which there is no evidence of carburization (251, 253).

Jewelry. One piece of iron jewelry, a toggle pin, comes from the Cultic Structure (249).

TELL ABU HUWAM

10th Century

Tools. One iron sickle was found in Level III.

Weapons. One iron arrowhead was found, also in Level III.

TELL ʿAITUN

12th Century

Jewelry. "Iron bracelets" were found in an early Iron Age tomb dated to the 12th century B.C.E.[7] (Dothan, 1982:44).

TELL AMAL[8]

10th Century

Tools. One axe or adze blade was recovered from Level 3 at Tell Amal.

TELL EL-ʿAJJUL

10th Century

Jewelry. One iron fragment, probably from a bracelet, comes from Tomb 1023 at Tell el-ʿAjjul.

TELL BEIT MIRSIM

10th Century

Tools. A total of six objects identified as tools come from Tell Beit Mirsim: a riveted knife; two fragments of one "tool"; three sickles; and one ploughshare.

TELL EL-FARʿAH NORTH

10th Century

All of the iron artifacts from Tell el-Farʿah North come from Stratum III.

Tools. One axehead, one sickle, a knife blade, two needles, a ploughshare, and a socketed pick.

Weapons. Four iron arrowheads.

Other. Two unidentified iron fragments.

TELL EL-FAR^{C}AH SOUTH

12th Century

Weapons. The remains of one dagger with an iron blade, a caste bronze handle, and a curved bronze pommel were found in Tomb 542, dating from approximately 1150 to 1100 B.C.E. The dagger was "killed" (snapped in two) and is the earliest example of iron at Tell el-Far^{C}ah (Dothan, 1982:32). Three small iron rings were found that were apparently part of the dagger's fittings. A bronze dagger was also found in this tomb.

Jewelry. "Several" iron bracelets also come from Tomb 542. "Several" iron rings come from Tomb 552, dating from slightly later than Tomb 542. Phase 1 Iron IB pottery and an anthropoid clay coffin were part of the tomb's remains (Waldbaum, 1966:332).

11th Century

Tools. Four iron tools come from 11th century contexts at Tell el-Far^{C}ah South. Two knives come from Tombs 227 and 615 (the latter containing Philistine pottery). A riveted knife was recovered from Tomb 562 that also contained an anthropoid clay coffin, Egyptian types of pottery characteristic of anthropoid coffin burials, Philistine pottery representing a fusion of Philistine and local decorative traditions, and "more typical" pottery (Dothan, 1982:32). A hafted axehead comes from Level 376.

Weapons. Three arrowheads come from levels 376 and 378.

Jewelry. One iron ring was found in Tomb 615 containing Philistine pottery and five bracelets come from Tombs 625, 617, 506, 859, and 839. Tombs 675, 839, and 859 contained Philistine pottery.

TELL EN-NASBEH

10th Century

Weapons. Two iron arrowheads come from Tomb 54 containing "Israelite" pottery.

Jewelry. An iron fibula and two iron rings come from Tomb 32, also containing "Israelite" pottery, and twenty-five iron ring fragments come from Tomb 54.

Other. One unidentified iron fragment was recovered from Tomb 54.

TELL ES-SA'IDIYEH

12th Century

Tools. One iron knife comes from Tomb 113 at Tell es-Sa'idiyeh (McGovern, 1982b).

TELL ESH-SHARI^{c}a

11th Century

Tools. One iron knife from Tell esh-Shari^{c}a has been dated to the 11th century (Dothan, 1982:92).

TELL ES-ZUWEYID

12th Century (Level N)

Tools. One iron tool fragment, possibly from a chisel, is dated to the 12th century B.C.E.

Weapons. One iron arrowhead.

11th Century (Level M)

Weapons. One iron spearhead.

Other. Two unidentifiable fragments.

10th Century (Level L)

Tools. One iron awl.

Weapons. Two dagger, one with a "rat-tail" tang, and three arrowheads, one possibly a lancehead, have been assigned to the 10th century.

TELL JEMMEH

11th Century

Tools. One riveted iron knife comes from 11th century Tell Jemmeh.

Weapons. One tanged arrowhead and one iron dagger.

Other. An unidentified curved iron fragment.

10th Century

Tools. One iron adze or axehead; two awls, a socketed axe or pick; four hoes with broad, flat blades and hammered open sockets; two ploughshares; a razor, called a "knife" by the excavator; a sickle; a broad edged chisel; and five knives, one from a four-room structure, were assigned to the 10th century.

Weapons. Two spearheads, one with a midrib and tang and one with a tang and no rib; and five arrowheads, one called a "borer" by the excavator come also from levels assigned to the 10th century.

Jewelry. Three rings, a bracelet, and two straight loop headed pins.

Other. A piece of iron wire with cylinders of bone and wood strung on it.

TELL QASILE

12th Century

Tools. The single example of iron from 12th century Tell Qasile is the remains of an iron knife blade with three bronze rivets attaching it to an ivory knife handle. The knife comes from the Stratum XII courtyard east of the temple. Included in the artifact inventory from the courtyard were an anthropomorphic pottery vessel and a scarab with a chariot scene. It is one of the earliest examples of an iron knife in Palestine and has been considered to be an important indicator of connections between Palestine and Cyprus (Mazar, 1978:78). Analysis indicates that it was probably not carburized (Stech-Wheeler et al., 1981: 257).

11th Century

Tools. Two iron knives come from Stratum X.

Weapons. One iron sword blade comes also from Stratum X.

Jewelry. One iron bracelet was found in the Stratum X temple. Associated artifacts included cult vessels and pottery, and a socketed bronze double-axe indicative of connections with the Aegean (Dothan, 1982:67).

Other. One piece of unworked iron comes from Stratum XII or XI.

10th Century

Tools. A knife with two bronze rivets and a sickle were found in Stratum IX.

Jewelry. One iron bracelet was also found in Stratum IX.

TELL QIRI (HA-ZORE^{C}A)

12th Century

Tools. A single iron axe of 12th century date has been recovered from Tell Qiri (Dothan, 1982:92 n.2).

TELL ZEROR

11th Century

All of the iron artifacts recovered from Tell Zeror came from tombs.

Tools. Five iron knives, one with iron rivets from Tomb I, one with a curved blade from Tomb III, one from Tomb V, and one from Tomb VII with one bronze rivet preserved, and a haft with iron rivets from Tomb V come from Tell Zeror.

Weapons. Three iron daggers have been found, two from Tomb V and one from Tomb VIII.

Jewelry. Six pieces of iron jewelry come from three different tombs: two bracelets from Tomb III, a bracelet from Tomb V, and two bracelets and a ring from Tomb V.

TIMNA^{C}

12th Century

Jewelry. Two iron bracelets come from the tumulus west of site 2.

92). Other. One unidentified iron fragment (Dothan, 1982:

NOTES

[1]Prausnitz refers to late 11th century B.C.E. "iron blades of bronze daggers" found in a cist tomb along with a double-axe, lanceheads, and fibulae. The present writer does not know if this is related to the iron knife cited by Waldbaum (1975).

[2]Maddin, et al., 1977:127; Muhly, 1982:50; T. Dothan, 1982:92.

[3]A number of the 10th century iron artifacts from Megiddo come from a small room abutting the court wall of the palace. The room also contained materials identified as iron ore, ash, and slag. The inventory is similar to that of the "Cultic Structure" at Ta^{c}anach. Both are conjectured to be metallurgic workshops (Stech-Wheeler, et al., 1981:256).

[4]Called a "pointed tool" by Waldbaum.

[5]Called a "knife" by Waldbaum.

[6]"Called "blades" by Waldbaum.

[7]T. Dothan refers to an "iron ring" in her chart of iron artifacts (1982:92) and to "iron bracelets" in her description of the tombs(44). The original report also refers to iron bracelets, but no iron rings (Department of Antiquities, 1968:194-195). Dothan also refers to the iron bracelets as having been found in the same tomb as the Philistine pottery. This does not parallel the original report which places them in separate tombs. The original report is followed here.

[8]No information was available to the present writer concerning this site. The reference in Waldbaum was a personal communication to her by G. Edelstein (1978:84 n. 148).

TABLES

TABLE 1. Iron Artifacts: Fifth and Fourth Millennium B.C.E.

SITE	DATE	ARTIFACTS	CONTEXT
		IRAN	
Tepe Sialk	4600-4100 B.C.E.	3 small spherical balls--meteoric	occupation
		MESOPOTAMIA	
Samarra	ca. 5000 B.C.E.	4-sided object--smelted	grave
		EGYPT	
el Gerzeh	pre-dynastic	9 beads	graves
Armant	ca. 3500-3100 B.C.E.	ring	grave

TABLE 2. Iron Artifacts: Third Millennium B.C.E.

SITE	DATE	ARTIFACTS	CONTEXT
	MESOPOTAMIA		
Anu Ziggurat	ca. 3100-2800 B.C.E.	meteoric fragment	between 2 temples
Khafaja	ca. 2800-2600 B.C.E.	unidentified "lump"	-
Kish	ca. 2800-2340 B.C.E.	3 pieces of iron inlay	palace
Tell Ahmar	ca. 2450-2340 B.C.E.	fragments of a dagger blade with a copper handle--smelted	copper hoard
Ur	ca. 2450-2340 B.C.E.	fragments of a flat tool blade--meteoric	Royal Cemetery
Chagar Bazar	ca. 2450-2340 B.C.E.	fragment--smelted	grave
	ca. 2450-2340 B.C.E.	2 smelted fragments	occupation
Mari	ca. 2450-2340 B.C.E.	unidentified number of fragments	Temple of Ishtar
	ANATOLIA*		
Troy	ca. 2600-2400 B.C.E.	macehead or finial --meteoric	treasure hoard
Alaca Hüyük	ca. 2400-2100 B.C.E.	2 pins with gold heads--1 meteoric	tomb
	ca. 2400-2100 B.C.E.	crescent-shaped plaque--meteoric	tomb
	ca. 2400-2100 B.C.E.	fragments of a knife	tomb
Tarsus	ca. 2100 B.C.E.	"lump"	small treasure
Dorak**	ca. 2400-2300 B.C.E.	sword with an obsidian hilt carved in the form of 2 leopards--inlaid with gold and amber	"royal tomb"

(continued)

TABLE 2.--Continued

SITE	DATE	ARTIFACTS	CONTEXT
	EGYPT		
Giza	ca. 2565-2440 B.C.E. (Dynasty IV)	a deposit of rust (terrestrial iron) on a flint wand	Valley Temple of Mycerinus
	Dynasty IV	rusted tool-- terrestrial iron	joint of the stones of the Pyramid of Cheops
Abydos	ca. 2345-2181 B.C.E. (Dynasty IV)	rust corroded to a group of copper tools	
Deir el-Bahari	ca. 2133-1991 B.C.E.	blade of an amulet with a silver Sphinx's head-- meteoric	tomb of Princess Aa Shait

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* J.D. Muhly refers to one of the earliest examples of iron used for something more than pins and beads--an iron sword from a tomb at Alaca Huyük in Anatolia--which is "clearly a ceremonial weapon," and whose blade "seems to have been made of smelted iron" (1980: 34). Waldbaum makes no reference to such a sword and Muhly does not cite a date.

** This tomb was "clandestinely" excavated and the sword has since disappeared. It is said to have been found with a treasure, and has been tentatively dated to EB III (ca. 2400-2300 B.C.E.) by an associated cartouche of Pharoah Sahure of the Fifth Dynasty (Waldbaum, 1980:71).

TABLE 3: Iron Artifacts: Midle Bronze Age

SITE	DATE	ARTIFACTS	CONTEXT
	ANATOLIA		
Alishai Hüyük	ca. 1900-1700 B.C.E.	small piece of decorative inlay set in the bronze head of a pin	occupation
	ca. 1900-1700 B.C.E.	small piece of "wire" used to fasten an arrow-head to its shaft	occupation
	ca. 1900-1700 B.C.E.	unidentified number of fragments	occupation
Kusura	ca. 1800-1600 B.C.E.	fragment	-
	EGYPT		
Buhen	ca. 1991-1786 B.C.E.	spearhead--smelted	Nubia-grave

TABLE 4. Iron Artifacts: Late Bronze Age

SITE	DATE	ARTIFACTS	CONTEXT
		MESOPOTAMIA	
Nuzi	15th century B.C.E.	dagger with a copper blade and an iron hilt and an iron rivet	temple
	15th century B.C.E.	bead	temple
		SYRO-PALESTINE	
Ugarit	ca. 1450-1350 B.C.E.	battle-axe with a cast-on copper socket and gold decoration--meteoric, mild form of steel	sanctuary
Minet el-Beida	13th century B.C.E.	rings (buried with silver and gold)	tomb
Alalakh	ca. 1450-1370 B.C.E.	"lumps" mixed with copper	palace
	ca. 1350-1273 B.C.E.	arrowhead	occupation
	ca. 1350-1185 B.C.E.	arrowhead	occupation
	ca. 1270-1185 B.C.E.	spatula	occupation
Megiddo	ca. 1400-1200 B.C.E.	ring	tomb
	Late Bronze Age	tool with an iron handle	-
Tell es-Zuweyid	ca. 1400-1230/ 1170 B.C.E.	2 arrowheads and a handle	occupation
Gezer§	Late Bronze Age	ring and 2 axe blades	water tunnel

§ The actual date of the tunnel is uncertain (Dever, 1976:49).

(continued)

TABLE 4.--Continued

SITE	DATE	ARTIFACTS	CONTEXT
		ANATOLIA	
Alaca Hüyük	ca. 1500-1300 B.C.E.	fragment--possibly of an armor scale --and a circular plaque	occupation
	ca. 1800-1200 B.C.E.	stamp seal, 2 nails, needle, arrowhead, dagger, bracelet, plaque, fragment, socketed handle, spearbutt, "axe-like" object	-
Boğazköy	ca. 1450-1200 B.C.E.	fragment, chisel, lugged axe-blade	lower city levels
Boğazköy (Büyükkale)	ca. 1450-1200 B.C.E.	fragment, lugged axe-blade, spearbutt	-
Boğazköy	ca. 1300-1200 B.C.E.	spearbutt	lower city temple
		EGYPT	
Thebes	ca. 1417-1379 B.C.E.	arrowhead	middle palace of Amenhotep III
Tell el-Amarna	ca. 1379-1362 B.C.E.	2 masses of rust found under bronze axe-head	-
Abydos	ca. 1567-1320 B.C.E.	small pin	-

(continued)

TABLE 4.--Continued

SITE	DATE	ARTIFACTS	CONTEXT
Thebes	ca. 1350 B.C.E.	Urs headrest found under a mummy's mask (meteoric), "eye-of-Horus" amulet on a gold bracelet found near the lower part of the mummy's thorax, dagger blade (meteoric) with a gold and jewel encrusted haft and sheath,§ 16 miniature chisel blades set in wooden handles (all found in a box with 6 different blade types represented).	tomb of Tutankhamen

§ There were two ceremonial daggers found in the tomb of Tutankhamen, one with an iron blade and one with a gold blade. J.D. Muhly makes the interesting observation that all the touring exhibits of the collection from this tomb have only included the gold dagger. The iron dagger has remained in Cairo, being regarded as too precious to ship around the world (1980:37).

TABLE 5. Iron Artifacts Predating the Iron Age from the Near East

	Iran	Meso-potamia	Egypt	Ana-tolia	Syro-Palestine	Total
Pre-third Millennium	1	3	10	-	-	14
Third Millennium	-	11	4	9	-	24
Middle Bronze Age (ca. 2000-1600 B.C.E.)	-	-	1	4	-	5
Late Bronze Age (ca. 1600-1200 B.C.E.)	-	2	20	20	10	52
	1	16	35	33	10	95

TABLE 6. TWelfth Century: Philistine

Site	Tools	Weapons	Jewelry	Other	Total
Azor	-	-	*1	-	1
Tell ʿAitun	-	-	*2	-	2
Tell el-Farʿah S.	-	*1	*4	-	5
Tell Qasile	**1	-	-	-	1
Total	1	1	7	0	9

* tomb or burial
** temple or cultic structure

TABLE 7. Twelfth Century: Non-Philistine

Site	Tools	Weapons	Jewelry	Other	Total
Baq^{c}ah Valley	-	-	*35	-	35
Beth Shean	3	1	*1	3	8
Har Adir	1	-	-	-	1
Madeba	-	-	*4	-	4
Megiddo	1	-	1	-	2
Tell es-Sa^{c}idiyeh	*1	-	-	-	1
Tell es-Zuweyid	1	1	-	-	2
Tell Qiri	1	-	-	-	1
Timna	-	-	**2	1	3
Total	8	2	43	4	57

* tomb or burial
** temple or cultic structure

TABLE 8. Eleventh Century: Philistine

Site	Tools	Weapons	Jewelry	Other	Total
Beth Shemesh	4	-	-	1	5
Gezer	*2	-	-	1	3
Tell el-Far^{c}ah S.	*3+1(4)	3	*6	-	13
Tell esh-Shari^{c}a	1	-	-	-	1
Tell Jemmeh	1	2	-	1	4
Tell Qasile	2	1	**1	1	5
Tell Zeror	*6	*3	*6	-	15
Total	20	9	13	4	46

* tomb or burial
** temple or cultic structure

TABLE 9. Eleventh Century: Non-Philistine

Site	Tools	Weapons	Jewelry	Other	Total
ʿAi	6	3	2	2	13
Beth Zur	-	-	1	-	1
Gibeah	1	-	-	-	1
Khirbet Raddana	2	-	-	1	3
Megiddo	*1+6(7)	*1	*2+2(4)	-	12
Taʿanach	**1	-	-	-	1
Tell es-Zuweyid	-	1	-	2	3
Total	17	5	7	5	34

* tomb or burial
** temple or cultic structure

TABLE 10. Tenth Century: Philistine

Site	Tools	Weapons	Jewelry	Other	Total
Ashdod	*1+2(3)	-	1	1	5
Tell el-ʿAjjul	-	-	1	-	1
Tell Jemmeh	18	7	6	1	32
Tell Qasile	2	-	1	-	3
Total	23	7	9	2	41

* tomb or burial

TABLE 11. Tenth Century: Non-Philistine

Site	Tools	Weapons	Jewelry	Other	Total
Achzib	*1	-	-	-	1
Bethel	4	5	1	1	11
Beth Shean	4	1	-	4	9
Beth Shemesh	2	*3	*1+2(3)	-	8
Gezer	*6+5(11)	5	*2+1(3)	3	22
Hazor	1	-	-	-	1
Lachish	*5+1(6)	2	2	-	10
Megiddo	9	22	*1+1(2)	-	33
Ta^{c}anach	**1+10(11)	4	**1	-	16
Tell Abu Huwam	1	1	-	-	2
Tell Amal	1	-	-	-	1
Tell Beit Mirsim	6	-	-	-	6
Tell el-Farah N.	7	4	-	2	13
Tell en Nasbeh	-	*2	*28	*1	31
Tell es-Zuweyid	1	5	-	-	6
Total	65	54	40	11	170

* tomb or burial
** temple or cultic structure

TABLE 12. Average Number of Artifacts Per Site

	Philistine	Non-Philistine
12th Century	2.25	6.33
11th Century	6.57	4.86
10th Century	10.25	11.33

TABLE 13. Total Numbers and Percentages of Iron Artifacts in Philistine and Non-Philistine Sites

	Philistine		Non-Philistine		Total	
	Number	Percent	Number	Percent	Number	Percent
12th Century	9	13.6	57	86.4	66	100
11th Century	46	57.5	34	42.5	80	100
10th Century	41	19.4	170	81.6	211	100

TABLE 14. Philistine: Types of Iron Artifacts

	Tools		Weapons		Jewelry		Other	
	N	%	N	%	N	%	N	%
12th C.	1	11.1	1	11.1	7	77.8	-	-
11th C.	20	43.5	9	19.6	13	28.3	4	8.7
10th C.	23	56.1	7	17.1	9	22.0	2	4.9

TABLE 15. Non-Philistine: Types of Iron Artifacts

	Tools		Weapons		Jewelry		Other	
	N	%	N	%	N	%	N	%
12th C.	8	14.0	2	3.5	43	75.4	4	7.0
11th C.	17	50.0	5	14.7	7	20.6	5	14.7
10th C.	65	38.2	54	31.8	40	23.5	11	6.5

TABLE 16. Tool Subtypes

	Bronze	Philistine (iron)	Non-Philistine (iron)
12th Century	14	1	6
11th Century	14	7	8
10th Century	15	10	13

TABLE 17. Weapon Subtypes

	Bronze	Philistine (iron)	Non-Philistine (iron)
12th Century	7	1	2
11th Century	7	3	4
10th Century	4	2	6

TABLE 18. Philistine: Context of Iron Artifacts

	Occupation		Burial		Temple	
	Number	Percent	Number	Percent	Number	Percent
12th Century	-	-	8	88.9	1	11.1
11th Century	18	39.1	27	58.7	1	2.2
10th Century	39	95.1	2	4.9	-	-

TABLE 19. Non-Philistine: Context of Iron Artifacts

	Occupation		Burial		Temple	
	Number	Percent	Number	Percent	Number	Percent
12th Century	14	24.6	41	71.9	2	3.5
11th Century	29	85.3	4	11.8	1	2.9
10th Century	116	68.2	52	30.6	2	1.2

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