

MINOAN CIVILIZATION—MINOAN LINEAR SCRIPTS 541

Minimus, of the carp family (Cyprinidae), is the minnow of Europe and northern Asia; it is distinguished from the dace and other allied cyprinids by its small scales. A length of three inches is usual, but specimens seven inches long are known. In New Zealand and Tasmania fishes of the family Galaxiidae are related to the pike, from which they differ in their uniformly small, weak teeth. They live in mud or among shallow streams and ponds. Among the killifishes, the common or mosquito fish (*Gambusia affinis*) is the best known. It occurs naturally in lowland marshes, pools and lagoons of the Atlantic and Gulf regions of the United States. It bears young and is exceedingly prolific. This fish is so effective as a destroyer of mosquito larvae that it has been widely introduced against mosquitoes. Anglers use all kinds of minnowlike fishes for bait. See also FISH; FISHING. (L. A. Wd.)

MINOAN CIVILIZATION: see AEGEAN CIVILIZATION;

MINOAN LINEAR SCRIPTS. This term denotes the developed varieties of writing used by certain Aegean civilizations (1900-1400) during the 2nd millennium B.C. Like other early writing systems in the near east (see CUNEIFORM), this Minoan type of script had its beginnings in pictography, originating on the island of Crete (see CRETE; *Archaeology*). There is conclusive evidence for more remote outside origin or influence, though the latter is an a priori assumption with those who believe in the monogenesis (single origin) of all writing.

Origins.—The origins of this script are seen on stone seals dating from the Middle Minoan period (beginning c. 2000 B.C.), and on the surface in different parts of Crete, and in early archaeological strata of the palace sites, notably Knossos and Phaistos. The latter contain seal impressions in clay and tags or fragments of the same material which served the practical purpose of identification. The pictographic origin is still clearly visible in the early hieroglyphic stage (e.g., a double axe, an eye, a cat's paw). Yet compared with the complicated word-syllabic stage of Egyptian, Mesopotamian, "Hieroglyphic Hittite," and other writing systems, with their mixtures of ideographic and phonetic signs, classifiers and complements, Minoan writing early developed an everyday practicality; already the hieroglyphs were limited in number that they indicate the emergence of a rudimentary but purely syllabic method for the phonetic rendering of proper names. A system of ideograms was restricted to a standard handful for objects listed on the tablets, accompanied by numerals and fractions; such ideograms were apparently never connected with syllabic writing. An isolated exception to this ancient practice is found on the so-called Phaistos disk, covered with hieroglyphic clay impressions made from movable types; but it is uncertain that this unique find is truly Cretan, and not an import from Asia Minor.

Linear A.—The finds are rather limited in scope and length; the writing and language remain undeciphered. About 1700 B.C. a more advanced cursive system of writing began to displace the hieroglyphs in Crete; in some archaeological strata the two systems are found side by side. The later system, called "Linear B," occurs at many Cretan sites, but the documents are not numerous; they come from Knossos, Phaistos, Palaikastro, Mallia, Tyllissos and elsewhere. The largest find was made at Knossos (well over 150 page-shaped clay tablets and seals), dating from the Late Minoan period (c. 1450 B.C.). Despite the range of the texts, Linear A tablets appear to record one and the same language (conjectured to be Minoan or Eteo-Cretan), at least to judge from recurring combinations of the same signs in different localities. The comparatively large uniform corpus of Linear A tablets has about 75 syllabic signs, many of which evidence partly cursive equivalents of related hieroglyphic forms. The oblong tablets necessitated frequent word-division by a vertical line, and a raised dot was used as a separator between words.

The direction of writing, which varied in the hieroglyphs, was uniformly from left to right. The system of ideograms continued the hieroglyphic tradition, but it also admits the ideographic

use of signs otherwise syllabic, probably by way of an acrophonic abbreviation using the initial syllable of corresponding words. Several phonetic signs might be joined into a complex monogram on the same principle, and phonetic ligatures were added to the ideograms proper. The ideograms were followed immediately by signs for numerals and fractions which differ from the corresponding hieroglyphic signs.

Linear B.—The Linear B script belonged entirely to the Late Minoan period. Sir Arthur John Evans found over 3,000 tablets or fragments in the latest (i.e., most recent) stratum at Knossos at the date of its destruction (c. 1400 B.C.), but not a single trace of Linear B has been discovered elsewhere in Crete. The script was used primarily on the Greek mainland during the chronologically parallel Late Helladic era. The largest corpus came from the site of Pylos in Messenia, where between 1939 and 1958 Carl Blegen excavated well over 1,000 tablets, many of considerable length and in an excellent state of preservation. Mycenae yielded over 50 tablets during the 1950s. Linear B is found also in inscriptions on jars and pots from Tiryns, Mycenae, Eleusis, Boeotian Orchomenos and, especially, Thebes.

There is no trace of monumental writing anywhere in the Minoan-Mycenaean orbit. Linear B, like its exclusively Cretan predecessor, served mainly for perishable records and inventories of royal palaces and commercial establishments. These temporary clay tablets (some of them of palm leaf shape, with long lines of text) were preserved by being baked in the conflagrations which destroyed the storerooms. Linear B contains 87 different syllabic signs, of which more than half correspond closely in shape to those of Linear A, while one third have no recognizable equivalents. The ideograms and numerals are quite close to the Linear A pattern, but the system of weights and measures contains distinctive signs for fractional quantities, placed after the ideograms but before the numerals; although several signs are obviously related in form to signs for fractions in Linear A, the very system represents a striking departure from the earlier method of reckoning. It might be said that in Linear A the commodities are measured in whole numbers and successively smaller mathematical fractions of an unstated total unit, while the Linear B system measures in terms of smaller conventional units in their own right, which happen also to be fractions of a larger basic unit.

Decipherment of Linear B.—One of the great achievements of decipherment in modern times has revealed that Linear B gives the Greek language of the 14th and 13th centuries B.C. The solution advanced in 1953 by Michael Ventris (q.v.) was founded on the surmise that the language is early Greek, and that accordingly Knossos must have been in the hands of Helladic mainlanders before its final destruction about 1400 B.C. In view of the earlier Minoan influence on the mainland, beginning about 1700 B.C., it is uncertain whether Linear B was adapted from the Cretan type by 13th-century Greeks at Knossos, or was developed on the mainland after Cretan models. The latter is more probable, although the Knossian corpus antedates all inscriptional evidence from the mainland. The signs generally represent open syllables like *ma*, *mi*, *mo*; such a system may have suited the Minoan language quite admirably, but for Greek it resulted in very awkward rules of orthography, characterized by superfluous vowels and an inability to note certain grouped or final single consonants, or to distinguish between voiceless, voiced and aspirated orders of phonemes. Thus *pa-te* may denote *pater* ("father") or *pantes* ("all"); such ambiguity, like the monotonous conciseness of the ledger style and the proliferation of proper names, places limitations on the results to be derived from knowledge of Linear B. Yet the impact of the decipherment has made itself felt in many classical studies.

A distant offshoot of the early Cretan scripts is the undeciphered Cypriote Linear or Cypro-Minoan type, found on a small scale in a number of baked clay tablets from Enkomi in Cyprus and Ugarit in Syria, dated from 1500 to 1100 B.C. A late development of it crops up in the Cypriote syllabary used in Cyprus for writing Greek and Eteo-Cypriote in classical times.

See M. Ventris and J. Chadwick, *Documents in Mycenaean Greek* (1956), with bibliography, pp. 428-435; J. Chadwick, *The Decipherment of Linear B* (1958). (J. Pl.)