

An obvious corollary to this problem is how to protect such common metals, and as lead paints are freely used for iron, it is interesting to note that they have been attacked on hygienic grounds, and a bitter controversy has arisen. The record of the leadless glaze campaign goes to show that mental plumbism is not uncommon, and on the evidence before us it appears more likely that no volatile lead compounds are given off by lead paints while drying, and that whatever toxic effects may occur are caused by the organic substances generated or volatilized in that process.—*The Engineer*.

### How the Weather Bureau Forecasts Storms, Frosts and Floods\*

MANY people have an idea that there is something mysterious and occult about the work of the Weather Bureau in forecasting the coming of storms, frosts and floods. Not a few think that the observers must necessarily get their data by reading the planets, the stars and the moon. As a matter of fact, the forecaster of the Bureau foretells the coming of disturbances in a business-like way, very similar to that in which a man who has ordered a shipment of goods would estimate the date of its arrival.

Suppose a business man had ordered a carload of pineapples from the Hawaiian Islands. He would know the average time it would take the steamer to make the trip to the Pacific port, the average time for unloading and loading into refrigerator cars, and the average number of days to be allowed these cars for their trip across

\* *Weekly News Letter* of the Department of Agriculture.

the continent to New York. His estimate, however, would be subject to error, because the steamship might be delayed by fog or the cars meet with an accident.

Storms, like pineapples, as a rule, do not originate in the United States. They come to us, some from the Philippines, Japan, Siberia, Alaska, Canada or the Gulf of Mexico. The Weather Bureau gets cable, telegraphic or wireless notice of a foreign storm. Station after station, or vessel after vessel reports the storm's arrival in its neighborhood, so that the general direction and rate of progress can be determined very early. In fact, the arrival of some storms can be foretold ten days in advance.

The forecasters watch for the region of low barometer which is the storm center around which the winds blow. This whirl or eddy moves bodily forward with the general eastward drift of about 650 miles a day in our latitudes. The forecaster determines the direction of movement of the storm and its velocity.

When weather disturbances are reported, the forecasters know from experience about how long it takes them to reach our Pacific Coast, and then how long after they will reach the Atlantic Coast. For example, if a storm coming from Siberia drifts eastward around the North Pole and reappears in Alaska, it should appear in Washington and Oregon in about two days; should get to the Great Lakes in six days and to the Atlantic Coast in seven or eight days.

Unexpected conditions may delay storms or divert them from the straight track, just as a refrigerator car may be thrown off its schedule or be shipped by accident

on a wrong road. Some of these storms deplete themselves by running into regions of high barometer which are of greater magnitude and extent than the storm itself. Some of them, however, travel completely around the world.

To keep tab on cold waves that come into the United States from Canada and Alaska, the Weather Bureau studies the Canadian Weather reports. England sends reports from Iceland, the British Islands and continental Europe, and daily reports come from St. Petersburg on the conditions in Russia and Siberia.

The same business-like system used in tracing the track of a storm is applied in determining the arrival of frosts.

Flood forecasts are made in much the same way. Information as to the amount of rainfall at the head waters of streams that cause floods are covered by telegraphic reports sent by local observers. As this rain reaches the main channel, the height of the water in the channel is determined by successive gaging stations. Past records establish how much a height, say, of 20 feet at Dubuque, Iowa, will produce at Davenport, another station 80 miles down the river, and at each point full allowance is made for the effects of water from tributaries, and from additional and local rainfall. As a result of these observations in the recent flood, the people of Cairo had warning a week or 10 days in advance. The Pittsburgh district can be given only 12 to 24 hours' notice, because a flood is upon them within 24 hours after a heavy rain storm.

## The Civilization of the Hittites of Syria\*

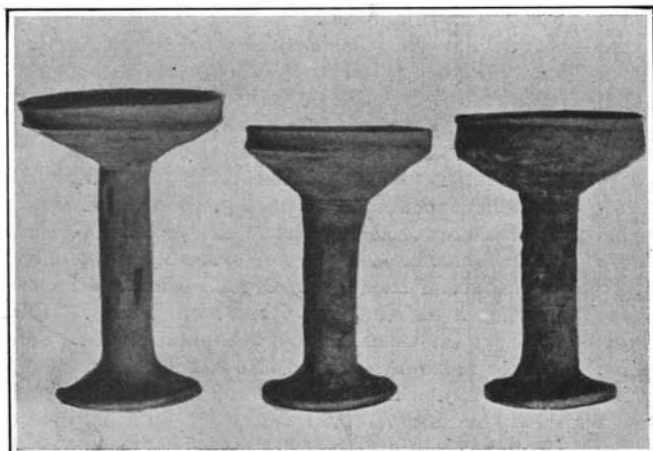
### Excavations at Carchemish

By D. G. Hogarth

THREE years ago the Trustees of the British Museum undertook what has proved the largest, and in many respects the most important and fruitful, excavation which they ever promoted. Three years have seen six campaigns in the soil on which there is no reasonable

the moat to a height, in places, of nearly fifty feet. Also three gates remain, of which two have been explored. Here, under Hellenistic and Roman structures, the explorers have laid bare remains of Hittite buildings, consisting of flanking towers and successive lion-guarded

according to sex and age. In front of the whole group is a hieroglyphic inscription, the longest known, which, with the legends graven near the head of each member of the group would tell us who they all were, could we read the script. We can, however, guess safely that it

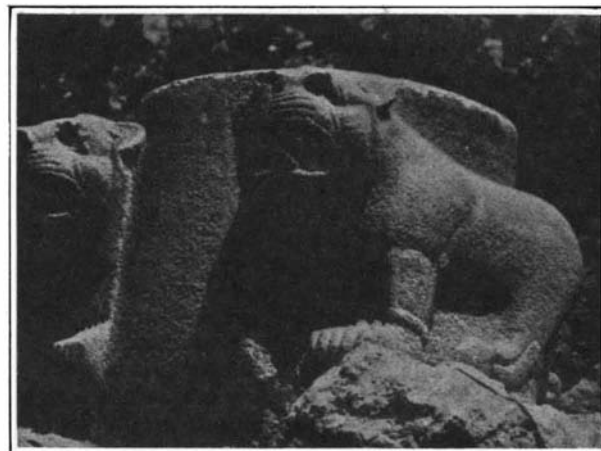


Probably of between 2,000 and 1,500 B. C. Vases of the peculiar form characteristic of the early cist graves.



Found on the citadel of the strongly fortified "royal city." A column base supported by two lions.

(By courtesy of the *Illustrated London News*.)



From the dado of mythologic slabs. A human and lion-headed sphinx with tail ending in a bird's head.

doubt once stood Carchemish, the leading city among the Hittite peoples of Syria. Mr. C. L. Woolley, well known for his Nubian researches, and Mr. T. E. Lawrence, who worked under Mr. Thompson and myself, have been in charge for the most part of this time, carrying on the excavation for a spring season and an autumn season in each year with between two and three hundred men. They have had their difficulties, and even their dangers, for Jerablus lies in a lawless region, among Kurdish tribes excited by recent events in Turkey; but they have faced and surmounted them with courage, persistence and signal use of the faculty which so many Britons possess for gaining the confidence of wild fighting folk. By the end of next spring season the Trustees, who have been splendidly supported by private munificence, will have expended some \$50,000 on the site; but the work, which is opening up Hittite history for us, and the nature of the civilization occupying the geographical space between the Semites and the Hellenes, will not be much more than half done.

The site consists of what is called a "royal city," that is, a strongly fortified enclosure containing palaces and their appurtenances, with a citadel, and an unfortified area inhabited by the commons. It is the first which is being explored. Its ring-wall, which enclosed about half a square mile on the bank of the Euphrates, has been stripped away to build a later town; but the huge mound on which the wall stood still remains, rising from

\* Reproduced from *Illustrated London News* together with all illustrations.

portals, one within another, divided by open courts, in each of which an enemy, breaking in, would have had to encounter flanking fire. The fine masonry of the southwest gate is well shown in one of our views, in which the spectator looks outward over the plain on which Nebuchadnezzar settled accounts with Pharaoh Necho in 605 B. C. Now it is diversified by the line, sheds and other constructions of the Baghdad Railway. In excavating this gate, the explorers found a fine head of a god or king of the latest Hittite Age, when, in the seventh century B. C., perhaps, the lords of Carchemish were Aramaean Semites. The back of the head of the God or King shows the turban-like covering worn by the figure. The North Gate, of still more elaborate construction and plan, is still under excavation.

Within the walls a large complex of Hittite palatial buildings has been partially cleared, together with a water-gate on the river bank which was flanked by great lions in dolerite, inscribed with Hittite hieroglyphic texts. The westernmost member of this complex is a large building entered by a portal from both jambs of which run, as far as the clearance has yet been made, dadoes of sculptured slabs, alternately of black dolerite and white limestone. The finest reliefs, those on the facade of the portal itself, show two men, probably two kings, one being an ally, followed by eight children, of whom the last still totters, holding to a staff, and a baby in the arms of a woman, who leads a pet animal. She should be the queen, who appears nowhere else in the group. The children throw knuckle-bones or carry whipping-tops

is a royal group of about the ninth century B. C.

The style and execution of these reliefs upset all our previous ideas about the quality of Hittite art; as do also the sculptures which line the opposite side of the portal—royal ministers and servants in whose delineation has been used a grace which is almost Greek. Of the soldiers who follow them—note their "Carian" helmets, as the Greeks would have thought—of the long file of priestesses and acolytes bearing animals for sacrifice, of the slabs of mythologic scenes beyond the soldiers, and of the other inscribed inner doorways, we can give only two or three specimen views. As excavation proceeds, this great series of sculptures will no doubt be found to be prolonged at either end.

From this building a wall, also bearing reliefs along all its length, runs up to a great staircase, which climbs up the face of the Acropolis, and is (or was) lined with sculptures of which some are still in position. To the left is another building of the palatial complex built on the terraced slope. Here was found a small, shrine-like chamber with elaborately inscribed portal, before which stood a great laver, supported, like Solomon's, by two bulls, which are shown in one of our views.

On the Acropolis the remains are less well-preserved because in Roman days a great temple was built there, whose foundations almost destroyed the large brick buildings of the Hittites. At the north end, too, Sargon the Assyrian, who captured Carchemish in 717 B. C., built a residence for his officer. This has been cleared and its remains appear in one of our photographs, which

looks northward up the Euphrates. But the Acropolis has yielded a most important set of early tombs, with which we can now compare the contents of another cemetery outside the walls.

From Jerablus and its neighborhood we have a long series of graves which show us the pottery and imple-

ments and seal of the Syrian Hittites from about 2,000 to about 400 B. C.; and when it is said, in conclusion, that the stratification of the city site gives us orderly evidence from the Neolithic Age to the close of the Bronze Age; that the development of Hittite plastic art can now be studied from its cradle to its grave; that

the same is true of the hieroglyphic script, of which over a hundred new texts have come to light; that we have cuneiform inscriptions already, and may at any moment get a bilingual key to the hieroglyphic puzzles—when so much can be said for three years' work on a part only of this great site, it is well worth digging completely.

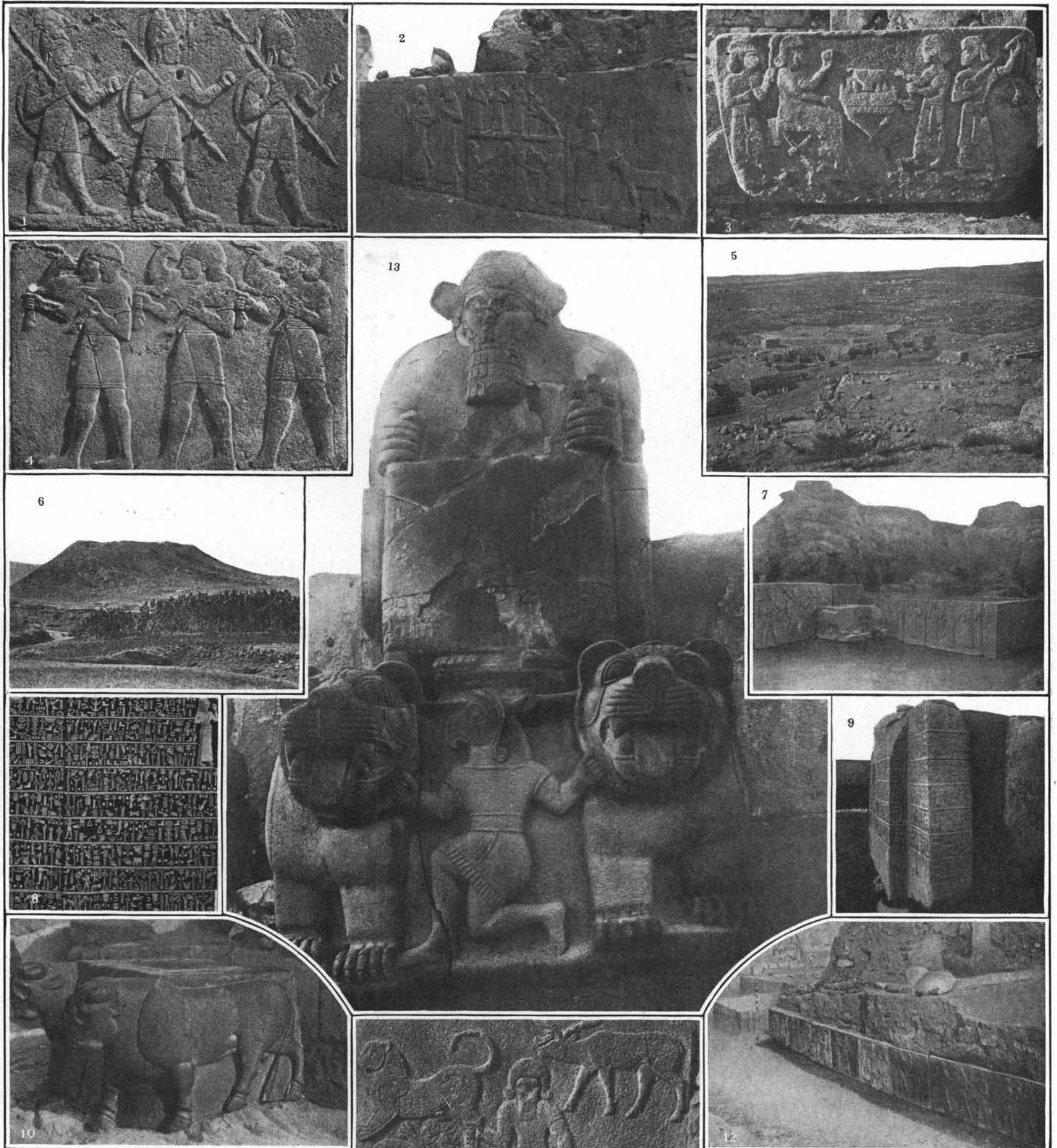


Fig. 1.—With armament recalling that which the Greeks believed they derived from Asia Minor. Soldiers of the ninth century; from the "King's" gate.

Fig. 2.—At the "King's" gate. The royal group; probably two kings, one being an ally, followed by eight children, and a woman (possibly the queen) carrying a baby and leading a pet animal—of about the ninth century B. C.

Fig. 3.—Perhaps of the twelfth century B. C., and one of the earliest reliefs found at the water-gate. A scene of sacrifice.

Fig. 4.—In ninth century style. Three acolytes bearing animals for sacrifice.

Fig. 5.—Seen from the citadel above the great

stairway. The area of excavations at Jerablus, the site of Carchemish.

Fig. 6.—Looking toward the Euphrates down the valley which protected the city on the north side. The citadel of Carchemish from the northwest.

Fig. 7.—Marching to meet the royal group at the "King's" gate. Ministers and soldiers.

Fig. 8.—The longest known hittite hieroglyphic

text. The great inscription in front of the royal group at the "King's" gate.

Fig. 9.—Possibly eleventh century. An inscribed door-jamb of the earlier palace.

Fig. 10.—From the court before the shrine. The great laver supported, like Solomon's, by two bulls.

Fig. 11.—From the dado of mythologic slabs. The hunter-god.

Fig. 12.—From the dado leading to the "King's" gate. Priestesses and Acolytes.

Fig. 13.—Inscribed with name and titles in the Hieroglyphic script, which no man can read. A bearded god of Assyrohittite style (eighth century B. C.?), seated on a base supported by two lions led by an eagle-headed figure.

By courtesy of the Illustrated London News.