

PROF. GARSTANG'S EXCAVATIONS IN
NORTHERN SYRIA AND IN THE SUDAN.

I.

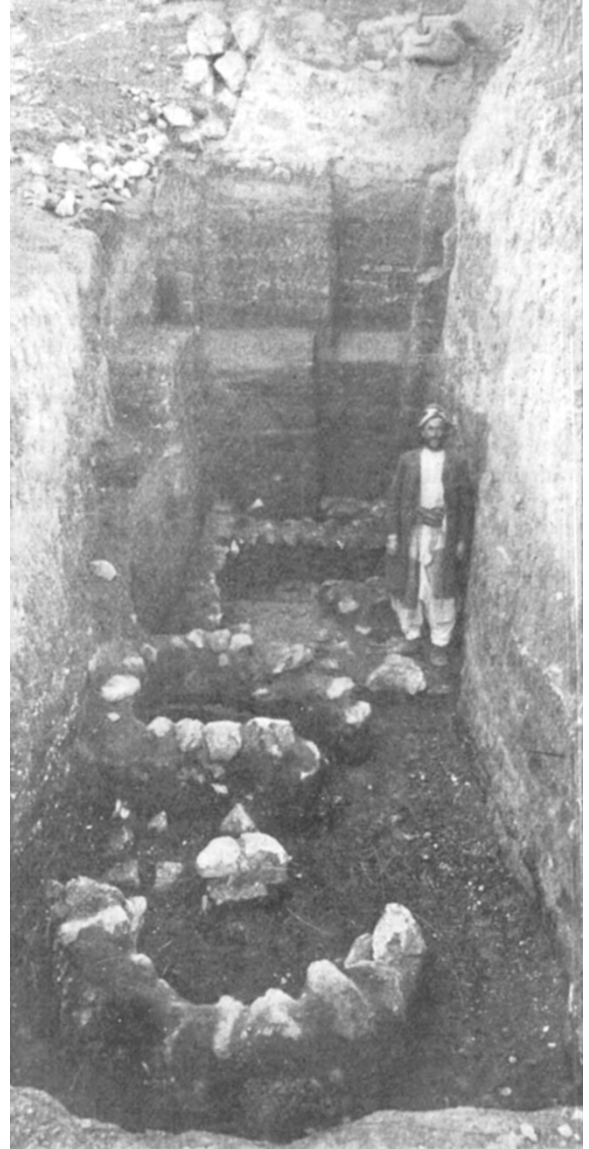
THE Hittite site of Sakje-Geuzi has already been described, both in this journal and in the *Liverpool Annals of Archaeology* for 1908. Some five or six large mounds are disposed in the form of a rough circle, and in the centre of these is a smaller one, which has proved to be the site of a royal residence. Work was begun in September, 1911, on the largest of them, called Songrus Eyuk. This, like others which have been examined, proved to be almost wholly artificial—the accumulation of ruined houses and *débris*. It rises to the height of 160 ft. above the plain, and is about 600 ft. by 500 ft. in greatest length and breadth, though the general appearance of its surface is more elongated than these figures suggest.

In the surface of the mound there were found some well-built fortifications, presumably of Seleucid origin. It was not until a depth of about 20 ft. was reached that traces of the Hittite occupation came to view. At 28 ft. the foundations of Hittite houses were laid bare, seemingly those of the latest Hittite period, being just previous to some dated objects of the twenty-sixth Egyptian dynasty. Hittite traces continued all the way down to a depth of 40 ft. A recognisable eighteenth dynasty object provided the much-wanted starting point for the dating of Hittite materials. It was not considered practicable to drive the sounding trenches to a deeper level; but around the slope of the mound examination disclosed the extensive fortification walls that had surrounded it at various periods, and three of these walls were of Hittite origin. That which corresponded to the eighteenth dynasty was double, like the main walls at the neighbouring royal site of Sinjerli. The entrance, at all times, seems to have been from the south, where the slope of the mound is less steep than elsewhere. Plans of the gate defences were obtained. Some instructive small objects were found in this excavation, including several seals and numbers of Syro-Hittite vases, some of familiar character, and others decorated in Hittite style. A terra-cotta Attis-head in "Phrygian hat" was rather striking, but probably post-Hittite.

The smaller mound, Jobba Eyuk, is also entirely artificial, but it rises only some 10 metres above the plain, and, unlike Songrus, it bore little trace of occupation in modern times. There were, however, a number of early and late Roman buildings, which interfered with the complete recovery of the original Hittite plan. The main wall, which is presumed to date from the ninth or tenth century, B.C., was generally 3 metres in thickness, with characteristic external buttresses at frequent intervals projecting a further metre. The form of the enclosure was generally quadrangular, 130 metres by 100. There was apparently only one main entrance, in the middle of the south-western wall. Here the excavators found the original position of that fine scene representing a royal lion-hunt,

the original of which was removed to Berlin some time ago. The royal palace was situated in the north-eastern portion of the enclosure, and, happily, the excavators have been able completely to recover its plan, together with that of the adjoining portion along the western side.

The palace portico, with its finely sculptured lion corner-stones and procession headed by the king, is already well known. It is being recon-



Bottom of a cutting in Jobba Eyuk, north Syria, showing Neolithic houses and burial cists.

stituted in facsimile in a new Hittite gallery in the Liverpool Public Museums. Passing beyond this, from the first hall there open out four doorways: that on the extreme right leads up, by a stairway of decorated stone slabs, to a room at a higher level; two doorways opposite give way to chambers, which, in their turn, lead on to others abutting on the outer wall. The fourth door to the left leads out of the main building to a cobb-

paved courtyard, and from a corner of this a flight of steps lead up on to the main wall, where presumably there was a walk along the ramparts. Without entering into details, the plan of the whole enclosure recalls, in general, that of the great palace at the foot of the Acropolis at Boghaz-Kevi, with a double series of rooms around, and an open space in the middle. From the main entrance a cobbled pathway, partly paved in late times with sculptured slabs, led directly towards the palace portico.

In construction the walls accord very well with what is already known of Hittite works in Syria. They were faced with irregular rough-faced stones, padded with rubble, while the upper courses were carried up in large bricks or brick slabs. In some cases the brick courses of the main wall were preserved to the number of nine or ten. The walls of the palace were of similar principle, though a proportionately smaller size of stones was employed, and only the foundations were of stone. The average thickness of the palace walls was considerable, being no less than $2\frac{1}{2}$ to 3 metres, and so well conserved was this portion of the enclosure, and so free from intrusion, that Prof. Garstang has been able to calculate that the original height of the building was about 5 metres.

This excavation was fortunately attended with much information as to details of Hittite archaeology. An instructive series of seals and small objects was recovered, and approximately dated. On the outer side of the enclosure, also, two student-members of the staff, Mr. Phythian-Adams and Mr. Hamilton-Beattie, carried on a minute examination of the nature and stratification of a great series of Hittite potsherds which had, through long ages, been accumulating at that point. It is hoped to assign definite dates to two, at least, of those strata, from the information secured in the neighbouring mound. At the bottom, instead of finding an undisturbed Neolithic floor, as was the case with Prof. Garstang's former experiment in 1908, they found the foundations and remains of Neolithic houses and burying places, a fact which it is instructive to compare with a recent discovery at Carchemish.

II.

Proceeding to Meroë at the beginning of December, work was at once resumed, with the help of a larger installation of machinery and about 500 native workmen, upon that part of the site which is called the Royal City. This is an enclosure about 1000 ft. by 500 ft., surrounded by a remarkably stout and well-built stone wall, and within this area, it will be remembered, last year there were found both the Bronze Head of Augustus, now in the British Museum, and a considerable hoard of gold treasure and royal jewels. Two royal palaces and several columned buildings had already been uncovered (see *Liverpool Annals of Archaeology*, 1911).

The higher portions of ground, representing, presumably, later periods than the average, were first examined. In this way, without describing the results too minutely, considerable traces of late

Greek and of Roman work were come upon, accompanied with fragments of imported pottery-ware, some with Græco-Egyptian potters' names. This was followed by a remarkably interesting discovery of a small prostyle temple, adhering closely in the details of construction to the strict classical model.

The most striking discovery, however, was that of the royal baths, a large building adjoining one of the royal palaces. This had been constructed with a certain sense of luxury, with cloisters and colonnades, its walls decorated with glazed tiles and frescoes, while numerous statues contributed to the effect. Two of its main chambers have been examined, the one, presumably, a sort of *tepidarium*, in which built-up seats, decorated with carved stone sphinxes and griffins, were arranged in a semi-circle. Near at hand was a large swimming-bath, into which the water was arranged to pour from numerous small cascades on every side. This result was contrived by means of aqueducts and storage cisterns, filled by patient labour from wells near at hand. The walls of this bath were decorated with frescoes, on which elephants and serpents may still be recognised. On the edge are still the figures of musicians, one playing the pipes, another the harp with a sleeping dog at his foot, while a third figure, that of a flute-player, was found in the excavation. All around were carved stone lions and bulls in alternation, while between them the water gushed from the holes arranged in the walls for that purpose, eight or ten on a side. In the corners the water poured through the open mouths of lions. A flight of steps led down to the bottom, about $2\frac{1}{2}$ metres below the inlet of the water. It was here that the most remarkable discoveries were made, for, apparently to fill up the tank so that building might proceed over the spot in a later period, many of the statues and carved stones and other convenient objects near at hand had been collected and thrown down one after the other. A number of the statues are capable of complete restoration; they include a local Venus, a great reclining figure in the well-known pose of the Vatican God-of-the-Nile, the flute player, and other musicians just mentioned, and other sculptures of semi-classical motive. So far as possible everything was replaced in its original position, and steps immediately taken to preserve this important monument. Those sculptures and other objects to which no place could be assigned have been brought to England and will be exhibited in the rooms of the Society of Antiquaries at Burlington House during July. Amongst these are a number of glazed decorative tiles and medallions, many of which also remain in position upon the wall of the bath. There will also be on exhibition a new series of decorative Meroitic pottery vessels, which have been found this year in greater quantity. The exhibition will be opened by the Bishop of London at a private view on July 8.

Summarising the historical results, it can now be seen that the history of Meroë can be divided into three main periods. The first is that of its origin, when the stone-walled Royal City was built

in the age of Aspelut, about B.C. 700. In this period Egyptian influences predominated in art, as witness the small objects found in the Lion Temple and the building of the Temple of Isis. The Sun Temple must also be assigned to this period, as well as the foundations of the Temple of Ammon on the outskirts of the city. In the second period, which archæology assigns to 300 B.C., the Egyptian motives gave way entirely to Greek, as witness a small cameo of galloping horses found last year, and the semi-classical statues and general design of the baths just described. This result would seem to accord entirely with what is told of Ergamenes by Diodorus. The third period begins, apparently, with the Christian era, and seems, so far as it has been developed, to have been dominated rather by Roman ideals, and it lasted, so far as determined, down to the middle of the 4th century, A.D., when there is a historical account of the invasion of a King of Axum.

The following axial bearings to magnetic north supplement those given by Prof. Garstang in his "Meroë," p. 26, n. 9:—

Royal Palace ...	294,	17° E.
Do. ...	295,	17° E.
Frescoed Hall ...	292,	25° 30' E.
Prostyle Temple ...	97,	29° E.
Royal Baths ...	195,	} 20° 30' E.
(East Wall)		
Royal City ...	290,	} 28° E.
(Main N.W. Wall)		

The magnetic deviation on December 27, 1910, was determined by observation of Betelgeuse and ε Pegasi as follows:—

Axis of Temple of Ammon, 260.	
True Bearing :	294° 3' 51.9"
Magnetic Bearing :	297 — }

The latitude and longitude of a point in this axis on the east wall of the Royal City are as follows:—

Lat.	16° 57'
Long.	33° 42'

COMMITTEE ON SIGHT TESTS FOR SEAMEN.¹

THE Departmental Committee appointed by the Board of Trade, in June, 1910, has reported at considerable length on the questions submitted to it, and has, it may be hoped, brought the controversy concerning them to a conclusion. The Committee was appointed

"to inquire what degree of colour-blindness or defective form vision in persons holding responsible positions at sea causes them to be incompetent to discharge their duties, and to advise whether any and, if so, what alterations are desirable in the Board of Trade sight tests at present in force for persons serving or intending to serve in the Merchant Service or in fishing vessels, or in the way in which these tests are applied."

The Royal Society was represented on the Committee by Lord Rayleigh and by Profs. Gotch, Poynting, Rucker, and Starling, or, after the beginning of 1911, by Prof. Sherrington in the place of Prof. Starling; and the Committee

¹ Report of the Departmental Committee on Sight Tests. (London: Wyman.) Price 4½d.

examined a large number of men of science, of ophthalmic surgeons, and of practical seamen, and conducted a large number of experiments, some of them at Shoeburyness, where distant lights could be observed, and the essential conditions of actual service be reproduced.

The Committee obtained the assistance of colour-blind persons in these experiments, and profited by their mistakes; and it heard the evidence, and examined the apparatus, of Dr. Edridge Green and other gentlemen. Finally, in the wool test for colour vision, it recommends the substitution of a dark brown skein for the red one hitherto employed, and, in the conduct of the test, the division of the whole collection of skeins into as many groups as there are test skeins. Each group should be composed of a fixed number of skeins which resemble the test skein, and a fixed number of those which colour-blind persons are liable to confuse with it; and candidates should be required to divide each group into two parts, those which resemble the test skein, and those which do not.

As an addition to the test thus modified, the Committee recommends the use of a lantern designed for the purpose, and capable of showing either a single light, through a circular opening of 0.2 inch in diameter, or two lights, through holes each 0.02 inch in diameter, and separated by a distance of one inch. This lantern is placed at the level of the candidate's eyes, and the candidate and examiners stand alongside of it, and observe the lights as reflected in a plane mirror ten feet from the lamp. At this distance the angular magnitude of the large aperture is equal to that of a ship's light at 200 yards, and the angular magnitude of the two smaller apertures corresponds to that of a ship's lights at 2000 yards. These are sufficient to test imperfect vision, but are well within the limits of visibility of normal persons.

The Committee recommends that both this lantern and the modified wool test should be used in examining the colour vision of all candidates, and believes that it would be unnecessary to re-examine for colour vision any person who had passed them. It also recommends that the more rigid test for form vision ordered by the Board of Trade to come into operation in 1914 should be adhered to, that any officer holding a certificate whose visual acuteness in the better eye has fallen below half normal should be considered incompetent, and that steps be taken to impress upon parents and guardians, and upon shipowners taking apprentices, the desirability of submitting boys to an expert examination before they adopt the sea as a profession.

A highly important further recommendation is that, whenever judicial inquiries into the causes of shipping casualties are being held, witnesses who give evidence as to the nature and position of coloured signals or lights should always be tested for colour and form vision. The report is signed by all the Commissioners, but Sir Norman Hill appends a memorandum dissenting from certain portions of the recommendations with regard to form vision.