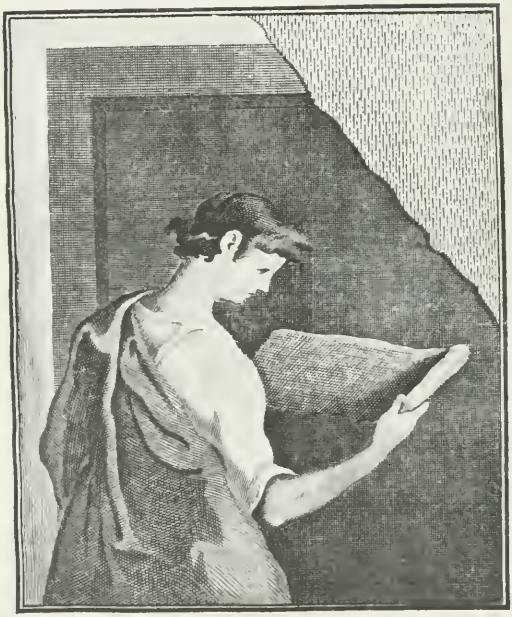

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Patron—THE QUEEN.

Quarterly Statement

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THE

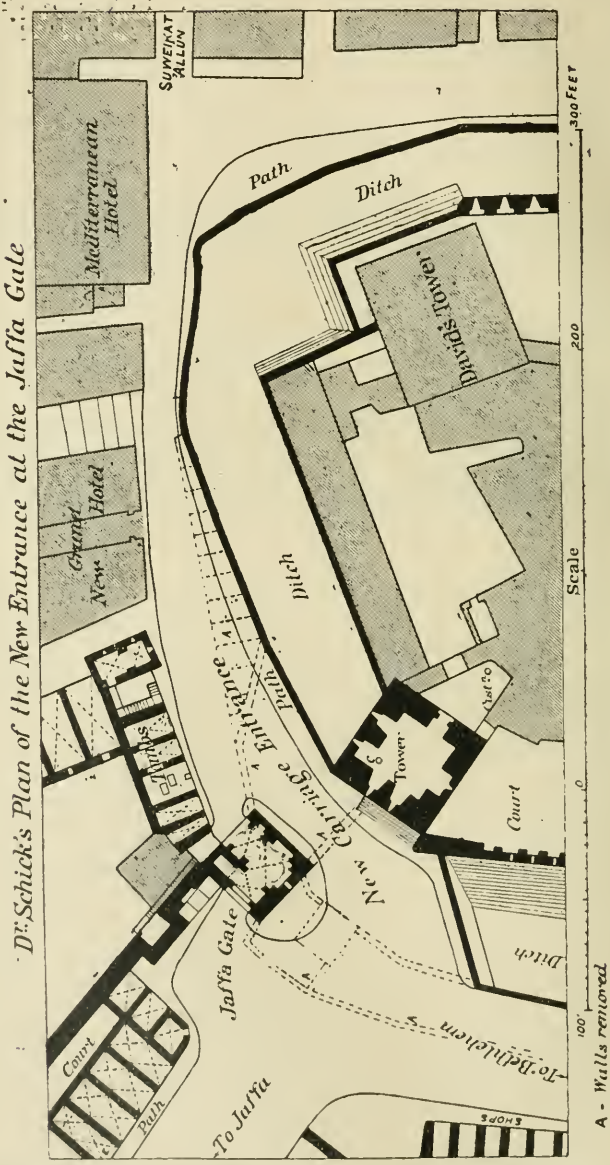
PALESTINE EXPLORATION FUND.

NOTES AND NEWS.

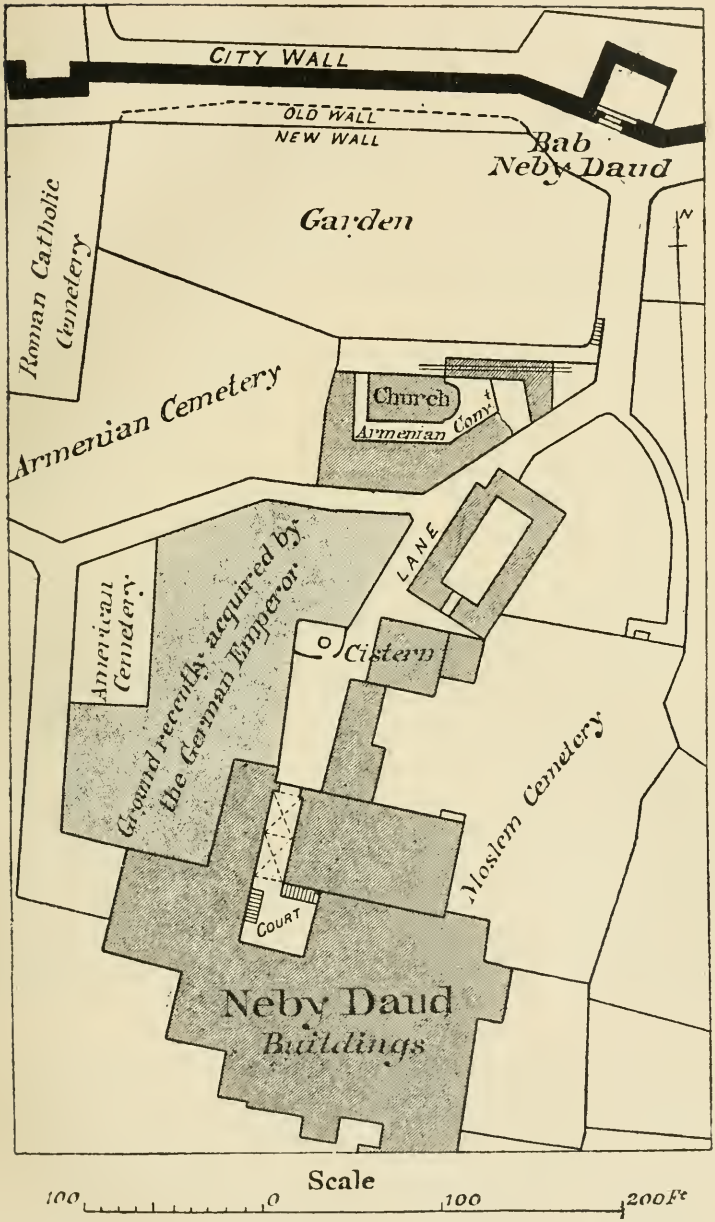
The Firman for prosecuting further excavations in Palestine having been received, Dr. Bliss and Mr. Macalister proceeded at once to Tell Zakarîya and commenced work there on 27th October. Their first reports will be found in the present number.

We deeply regret to record the death, on Saturday, 10th December last, of Professor T. Hayter Lewis, who had been a member of the Executive Committee of the Fund since 1879, although for the last few years he was seldom able to attend the meetings owing to ill health. Mr. Lewis was born in London, and spent the greater part of his life in the metropolis. He was articled to an architect in Sackville Street, studied at the Royal Academy, where he took a silver medal for architectural drawing, and subsequently entered the office of Sir William Tite, who built the Royal Exchange. In 1860 he was appointed Honorary Secretary to the Institute of Architects, in 1865 was elected Professor of Architecture at University College, and in 1871 was chosen Dean of the Faculty of Arts. Subsequently he travelled much on the Continent and made two journeys to the Holy Land. Besides much other literary work, Professor Lewis contributed several valuable papers to the *Quarterly Statement* of the Fund, annotated the Palestine Pilgrims' Text Society's translation of Eusebius's "Churches of Constantine at Jerusalem," and "The Buildings of Justinian," by Procopius, and published his well-known work on the "Holy Places of Jerusalem." His great architectural knowledge and his never-failing courtesy and kindliness

of nature had gained for him the esteem of a wide circle of friends.



We are enabled to give in this number of the *Statement* Dr. Schick's plan of the alterations at the Jaffa Gate, which were



PLAN SHOWING GROUND RECENTLY ACQUIRED BY THE GERMAN EMPEROR.

made on the occasion of the German Emperor's visit. The top of the wall which connected the gate with the castle, and some modern walls, were removed and the ditch partially filled up so as to enable His Imperial Majesty to drive or ride conveniently into the city. Also we reproduce a plan which Dr. Schick has furnished of the piece of ground, near Neby Daûd, which has passed into possession of the Emperor. With reference to the latter, Dr. Schick writes:—"On a certain day, I think it was the 1st of November, the Emperor and his suite and several high Turkish officials from Constantinople went there, and the ground was in regular form given over to the Emperor. The German eagle was put on two poles with a cross-piece, and a watch of two soldiers set there. All took place without any interruption or difficulty. The situation of the ground, as shown on the plan, is close to the wall of Neby Daûd. Whether the cistern is included I do not know. The place will remain German property under the protection of the Emperor, who has handed it over, for use and building upon it, to the German Roman Catholics established in Jerusalem. It contains about 1,500 square yards, and most probably when the rubbish is removed the foundations of the ancient Zion Church will be found, as in the American burial ground adjoining it (which was last year purchased by the Roman Catholics at a rather high price) a strong corner of a large ancient building was found some years ago when excavations were made. As the east end of the adjacent buildings belonging to the Armenians was fallen down they had to build it up again, and in so doing enlarged the place. In digging the foundations they discovered an important underground channel. But as they would not allow me to go into it I cannot tell more about it. The workmen said a man may walk in it. Recently this convent was obliged to take down the northern boundary wall of its ground and to build it up in a straight line (as shown on the plan), so the road along the outside of the city wall there is now wide enough for carriages to pass."

Professor Clermont-Ganneau has courteously placed at the disposal of the Fund a copy of his paper on the inscription recently discovered by Père Lagrange at Gezer, which was read before the Académie des Inscriptions on 28th October last. A translation of this paper, with illustrations, will be published in the *Quarterly Statement* for April next. This inscription, like those previously discovered, is in Greek and Hebrew—

Ἀλκίου, תחם גזר—and goes to support M. Ganneau's view that these inscriptions served to mark the boundary of the old priestly city.

We have received from the pen of Mr. Philip Baldensperger an essay on "Woman in Palestine," which will be published shortly. Colonel Conder, to whom it was referred by its author's desire, thus writes of it:—"Mr. Baldensperger's MS. is a very valuable description of the natives of Palestine. It contains many things new to me, and hardly anything that my experience does not agree with. It is, moreover, thoroughly sympathetic, and represents the peculiar humour of the people very well. . . . . The song of the Egyptian soldier is worthy of Rudyard Kipling."

Owing to pressure on our space the publication of the Rev. John Zeller's paper on "The Bedawîn" is postponed until April.

Legacies to the work of the Fund:—

At the end of 1897 the Treasurer received from Messrs. Hunt, Curry, Nicholson, and Co., of Lewes, a cheque for £1,000, being a legacy under the will of the late Mr. Edward Cooper, of 6, Roland Gardens, London.

In August last a legacy of £100 was received under the will of the late Henry Smiles, Esq., per Messrs. Tatham and Procter, of 36, Lincoln's Inn Fields.

Notice has been received from our Honorary General Secretary for America, Professor Theodore F. Wright, Cambridge, U.S.A., that under the will of the late Rev. Walter G. Webster, a sum of 1,000 dollars is bequeathed to the Fund. Mr. Webster was one of the victims on board the ill-fated French steamer, "La Bourgogne," which was sunk in a collision with the British ship "Cromartyshire," on July 4th last.

The Committee are glad to say that they have received the remainder of the MS. of Professor Ganneau's "Archæological Researches in Jerusalem and its Neighbourhood." The MS. is now being translated, and will be in the press shortly.

Dr. Bliss's detailed account of his three years' work at Jerusalem is now ready. It is published as a separate volume

with the title "Excavations at Jerusalem, 1894–1897," and is copiously illustrated with maps and plans. Price to subscribers to the work of the Fund, 8*s.* 6*d.*, post free.

Subscribers in U.S.A. to the work of the Fund will please note that they can procure copies of any of the publications from Rev. Professor Theo. F. Wright, Honorary General Secretary to the Fund, 42, Quincy Street, Cambridge, Mass.

Reduction in the Price of Maps.—The Committee are pleased to announce that a reduction has been made in the price of the Old and New Testament Maps.

The 12-sheet Old and New Testament Map, hitherto supplied at 12*s.* 6*d.*, can now be had for 10*s.* 6*d.* (unmounted) by subscribers to the work of the Fund.

The 20-sheet Old and New Testament Map, hitherto supplied at 23*s.*, can now be had for 17*s.* 6*d.* (unmounted) by subscribers to the work of the Fund.

The Museum at the office of the Fund in the new premises at 38, Conduit Street (a few doors from Bond Street), is open to visitors every week-day from 10 o'clock till 5, except Saturdays, when it is closed at 2 p.m.

The income of the Society, from September 23rd to December 22nd, 1898, was—from Annual Subscriptions and Donations, including Local Societies, £645 10*s.* 0*d.*; from Lectures, £4 7*s.* 6*d.*; from sales of publications, &c., £240 19*s.* 4*d.*; total, £890 16*s.* 10*d.* The expenditure during the same period was £935 8*s.* 8*d.* On December 22nd the balance in the Bank was £683 4*s.* 4*d.*

Memo. for Subscribers to the Survey of Palestine.—In the original programme it was intended that the "Archæological Researches" of M. Clermont-Ganneau should be published in one volume, but the work increased so much since its commencement that the Committee found it necessary to arrange for the publication of the whole in two volumes. Vol. II has been published in advance for the reasons stated in the prefatory note.

Vol. I, which treats of Jerusalem and its neighbourhood, is now well forward, and, when ready, will be sent out to the first 250 Subscribers without any increase in their subscriptions for the full set.

The set consists of "The Survey of Eastern Palestine," by Lieut.-Colonel Conder, LL.D., R.E., in one vol.; "The Fauna and Flora of Sinai, Petra, and the Wâdy 'Arabah," by H. Chichester Hart, B.A., in one vol.; "The Archæological Researches," by Professor Clermont-Ganneau, in two vols. Four volumes in all.

There are only a few copies of the sets left at the price of £7 7*s.*

The price of a complete set of the translations published by the Palestine Pilgrims' Text Society, in 13 volumes, with general index, bound in cloth,

is £10 10*s*. A catalogue describing the contents of each volume can be had on application to the Secretary, 38, Conduit Street.

It may be well to mention that plans and photographs alluded to in the reports from Jerusalem and elsewhere cannot all be published, but all are preserved in the office of the Fund, where they may be seen by subscribers.

Branch Associations of the Bible Society, all Sunday Schools within the Sunday School Institute, the Sunday School Union, and the Wesleyan Sunday School Institute, will please observe that by a special Resolution of the Committee they will henceforth be treated as subscribers and be allowed to purchase the books and maps (by application only to the Secretary) at reduced price.

The Committee have to acknowledge with thanks the following donations to the Library of the Fund :—

"Bulletin de Correspondance Hellénique" (ΔΕΛΤΙΟΝ ΕΛΛΗΝΙΚΗΣ ΑΛΛΗΛΟΓΡΑΦΙΑΣ), i–x. Vingt-deuxième année, Janvier—Octobre, 1898.

"Sites and Scenes." A description of missions to Jews in Eastern lands. By Rev. W. T. Gidney, M.A. From the Author.

"Magic, Divination, and Demonology among the Hebrews and their Neighbours, including an Examination of Biblical References and of the Biblical Terms." By T. Witton Davies, B.A., Professor of Old Testament Literature, Baptist College, and Lecturer in Semitic languages, University College, Bangor. From the Author.

"Sites and Scenes," Part II, by the Rev. W. T. Gidney, contains a very interesting sketch of the history and present condition of Jerusalem and the other holy cities of the Jews in Palestine. In reference to the work of the Palestine Exploration Fund, its author writes :—"Without doubt these researches have thrown a flood of light upon almost every topic of inquiry, and awakened throughout Christendom a vast amount of interest in the land. The Fund consequently deserves the most hearty and thorough support."

The Committee will be glad to receive donations of Books to the Library of the Fund, which already contains many works of great value relating to Palestine and other Bible Lands. A catalogue of Books in the Library will be found in the July *Quarterly Statement*, 1893.

While desiring to give publicity to proposed identifications and other theories advanced by officers of the Fund and contributors to the pages of the *Quarterly Statement*, the Committee wish it to be distinctly understood that by publishing them in the *Quarterly Statement* they neither sanction nor adopt them.

In order to make up complete sets of the "Quarterly Statement" the Committee will be very glad to receive any of the back numbers.

Subscribers who do not receive the *Quarterly Statement* regularly are asked to send a note to the Acting Secretary. Great care is taken to forward each number to those who are entitled to receive it, but changes of address and other causes occasionally give rise to omissions.

The Committee of the Palestine Exploration Fund desire to make clear that they have no book on their List of Publications called "Picturesque Palestine," nor is any person authorised to represent this book as published by the Society; nor has the Society any book-hawkers in its employment.

Tourists are cordially invited to visit the Loan Collection of "Antiques" in the Jerusalem Association Room of the Palestine Exploration Fund, opposite the Tower of David, Jerusalem. Hours: 8 to 12, and 2 to 6. Maps of Palestine and Palestine Exploration Fund publications are kept for sale.

Photographs of Dr. Schick's models (1) of the Temple of Solomon, (2) of the Herodian Temple, (3) of the Haram Area during the Christian occupation of Jerusalem, and (4) of the Haram Area as it is at present, have been received at the office of the Fund. Sets of these photographs, with an explanation by Dr. Schick, can be purchased by applying to the Secretary, 38, Conduit Street, W.

The authorised lecturers for the Society are—

America.

Professor Theodore F. Wright, Ph.D., 42, Quincy Street, Cambridge, Mass., Honorary General Secretary of the Palestine Exploration Fund for the United States. His subjects are as follows:—

(1) *The Building of Jerusalem.*
(2) *The Overthrow of Jerusalem.*
(3) *The Progress of the Palestine Exploration.*

England.

The Rev. Thomas Harrison, F.R.G.S., The Vicarage, Appledore, Ashford, Kent. His subjects are as follows:—

(1) *Research and Discovery in the Holy Land.*
(2) *Bible Scenes in the Light of Modern Science.*
(3) *The Survey of Eastern Palestine.*
(4) *In the Track of the Israelites from Egypt to Canaan.*
(5) *The Jordan Valley, the Dead Sea, and the Cities of the Plain.*
(6) *The Recovery of Jerusalem—(Excavations in* 1894).
(7) *The Recovery of Lachish and the Hebrew Conquest of Palestine.*
(8) *Archæological Illustrations of the Bible.* (Specially adapted for Sunday School Teachers.)

N.B.—All these Lectures are illustrated by specially prepared lantern slides.

The Rev. Charles Harris, M.A., F.R.G.S., Appledore, Ashford, Kent. (All Lectures illustrated by lantern slides.) His subjects are as follows :—

(1) *Modern Discoveries in Palestine.*
(2) *Stories in Stone; or, New Light on the Old Testament.*
(3) *Underground Jerusalem; or, With the Explorer in* 1895.
Bible Stories from the Monuments, or Old Testament History in the Light of Modern Research :—
(4) A. *The Story of Joseph; or, Life in Ancient Egypt.*
(5) B. *The Story of Moses; or, Through the Desert to the Promised Land.*
(6) C. *The Story of Joshua; or, The Buried City of Lachish.*
(7) D. *The Story of Sennacherib; or, Scenes of Assyrian Warfare.*
(8) E. *The Story of the Hittites; or, A Lost Nation Found.*

Scotland.

The Rev. James Smith, B.D., F.S.A., F.R.G.S., St. George's-in-the-West Parish, Aberdeen.

His subjects are as follows :—

(1) *The Palestine Exploration Fund.*
(2) *A Pilgrimage to Palestine.*
(3) *Jerusalem—Ancient and Modern.*
(4) *The Temple Area, as it now is.*
(5) *The Church of the Holy Sepulchre.*
(6) *A Visit to Bethlehem and Hebron.*
(7) *Jericho, Jordan, and the Dead Sea.*

The Rev. W. Burnet Thomson, M.A., B.D., Galashiels, N.B. His subjects are as follows :—

(1) *The City of the Great King; or Jerusalem and the Explorer.*
(2) *The Temple, the Sepulchre, and Calvary.*
(3) *Southern Palestine.*
(4) *Jerusalem to Damascus.*
(5) *Palestine and Jesus Christ* (*for children*).
(6) *The Bible and the Monuments. Discoveries in Ancient Land.*

All illustrated with lantern slides.

Wales.

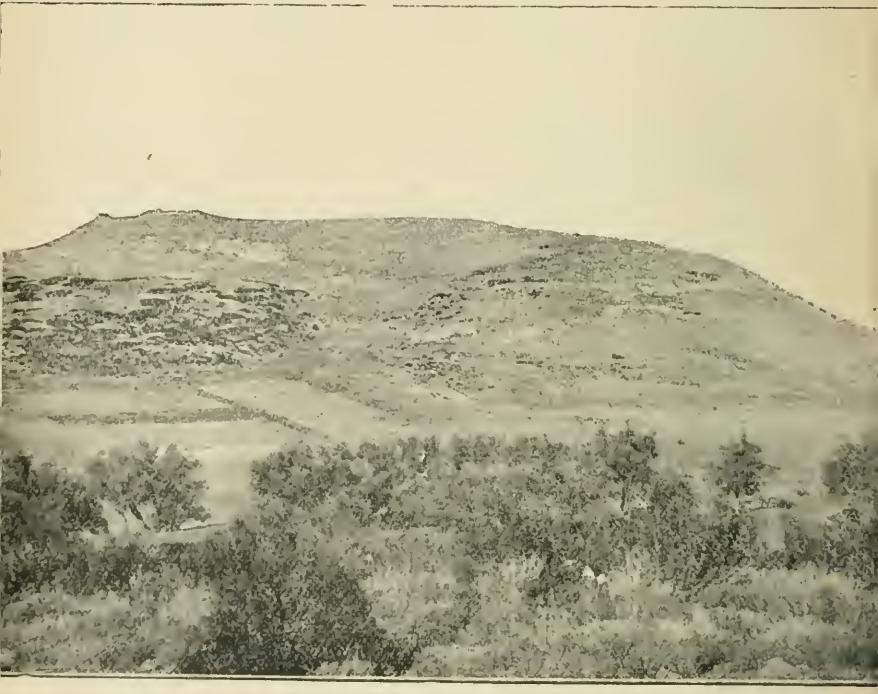
The Rev. J. Llewelyn Thomas, M.A., Aberpergwm, Glynneath, South Wales. His subjects are as follows :—

(1) *Explorations in Judea.*
(2) *Research and Discovery in Samaria and Galilee.*
(3) *In Bible Lands; a Narrative of Personal Experiences.*
(4) *The Reconstruction of Jerusalem.*
(5) *Problems of Palestine.*

FIRST REPORT ON THE EXCAVATIONS AT TELL ZAKARÎYA.

By F. J. Bliss, Ph.D.

For almost six weeks we have been encamped at this place, and I must now submit a general report of the work done. General it must be from the circumstances of the case. Several distinct operations have been taken in hand, and are as yet incomplete; for example, a contoured survey of the Tell, excavation of the



View of Tell Zakarîya from the East.

large building on its summit, a large clearance to the rock inside the enclosure, &c. I must content myself with outlining the main features of the work, leaving a more scientific account for a later issue of the *Quarterly*.

First I must inform my readers how we happen to be excavating at Tell Zakarîya. After the close of the work at Jerusalem in June, 1897, in accordance with the Committee's instructions, I paid a visit to Tell-es-Sâfi, not to report on that site, as it had already been chosen as the field for the new excavations, but to examine the outlying districts, with a view to including within the 10 square kilometres permitted by the Turkish law on excavations, such ruins as might appear to me to be ancient and important. On referring to the map of the Survey, in Jerusalem, I found the ruins to be very numerous, and by consulting the text of the "Memoirs," I was able to eliminate from the list many which Colonel Conder pronounced to be unimportant, as, for example, those consisting merely of small heaps of stones. In my reconnaissance I was accompanied by our Imperial Commissioner, Shauket Effendi. We took train to Deir Abân, where our horses awaited us. The weather was very hot, and we were glad to stop for lunch in the cool Convent of Deir Jemal. Thence to Tell Zakarîya the ride is somewhat over an hour in length. Mounting the steep side to the summit, I was at once struck by the natural strength of the site. The hill stands almost isolated, rising abruptly for almost 350 feet above the Vale of Elah, which, coming west from the ancient Shocoh, sweeps around the eastern and northern sides of the Tell, and continues west through the low hills of the Shephelah till it debouches into the plain at Tell-es-Sâfi, five miles away in a direct line. To the west the fall is also very great, while to the south the Tell is joined by a neck of land (about 100 feet below the summit) to a hill beyond. The summit is about 350 yards long by 150 yards broad. Far away to the west a long line of sea is visible, and between lies almost the whole land of Philistia. The most prominent feature is the bold hill of Tell-es-Sâfi, while the gardens and houses of Ramleh and the sand-dunes near Jaffa are distinct. The position of Ekron, Jamnia, Ashdod, and Ascalon may be made out, and a long part of the way towards Gaza. To the east appears the long line of the Judæan mountains, separated from the Tell by the low hills, sparsely and soberly clad with brush and scrub, which make the Shephelah of to-day a great charcoal country. Immediately below lies the Vale of Elah,

the ancient highway from the plain to Hebron, and here over a quarter of a mile broad.

Turning from the view to the Tell itself, I found hardly any superficial traces of building, save for a line of stones cropping out from the surface of a raised mound, which appeared to be an accumulation of some 25 feet of *débris* above the general level of the summit. The whole surface was strewn with potsherds, and directing my servant to collect me a little heap of pottery, I examined the specimens, while he made a second heap. This operation was continued until I had examined several hundred sherds. Among many pieces which were indeterminate, I was glad to notice the general absence of Roman ware and the presence of Jewish types. Two or three Roman bits did occur, but the slight proportion of these to the other types made me hope that their presence might be merely sporadic. Experience has shown me that on a genuine Roman site the pottery fragments are unmistakable. I quite recognised the possibility that the indeterminate ware might represent some late period during which fragments of Jewish and Roman ware belonging to earlier occupations might have found their way to the surface, but the slight amount of *débris* appeared to me to be against this view, and with considerable confidence before riding away I marked down Tell Zakarîya in my note-book as "an important and ancient site." Colonel Conder had already come to this conclusion. I am glad to say that the inferences drawn from my brief examination of the surface have been justified by the excavations of the last few weeks. After having furnished the world with a key to the pottery of Palestine by his work at the stratified mud-brick mound of Tell-el-Hesy, Dr. Petrie wrote:—"A single glance at a mound of ruins, even without dismounting, will show as much to anyone who knows the styles of the pottery, as weeks of work may reveal to a beginner." I have him to thank for having first placed this key in my hands.

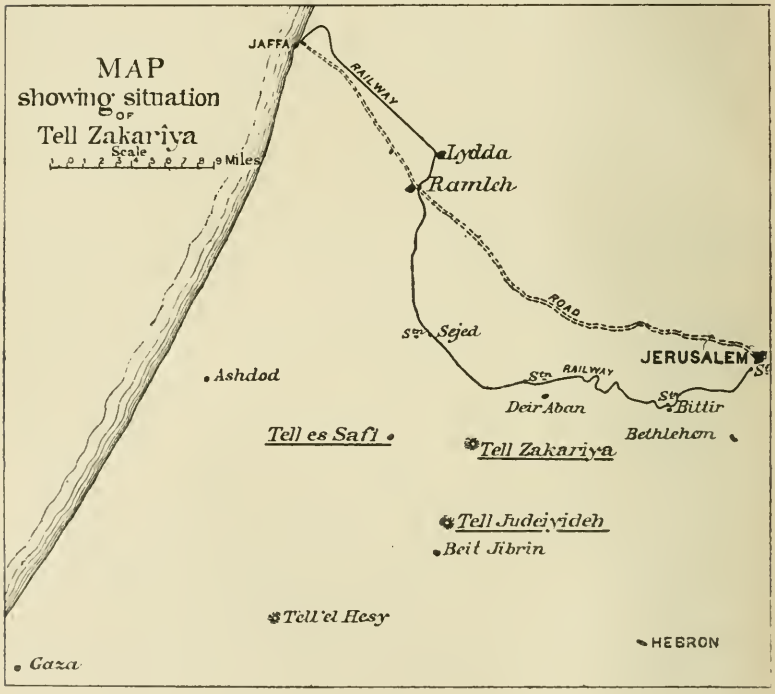
We found our camp pitched above the white cliffs of Tell-es-Sâfi, on the north end of the mound. I had visited the place before and had agreed with Petrie as to the antiquity of the site, but it was a disappointment to note how large a part of the summit is occupied by the modern village with its rich

and extensive tobacco fields. Moreover, in order to reach the lower levels on the knob of the hill, it would be necessary to dig through the crusading remains of Blanche-Garde, the famous fortress, a few traces of which have been recently uncovered by the natives. A crowd of villagers were squatting about the tents, and many expressed wonder that we dared to risk camping for even two nights within reach of the deadly malaria which hangs over the watercourse, filled during the autumn, when the winter rains have been heavy, with dank green pools. They declared that at such times many of the inhabitants migrate for a season, and the rest fall ill. The view from the summit is similar to that seen from Tell Zakarîya, but not so extensive as it is 600 feet lower.

The next day we rode south-east, past Khurbet Dhikerîn (identified by some with Gath), past the modern village of the same name, with its wonderful system of ancient rock-hewn cisterns, to Tell-ej-Judeideh, a lofty mound near Beit Jibrîn (Eleutheropolis). This Tell is similar in form to Tell Zakarîya, having a square top (the artificially scarped sides directed to the cardinal points), and a raised mound at one end. The examination of the pottery showed the same results as found the day before at Tell Zakarîya. From the summit I could plainly see Tell Bornât, but as it was sufficiently described in the notes at the end of Petrie's "Tell-el-Hesy" I did not visit it. Like Tell Zakarîya, Tell-ej-Judeideh is unencumbered with modern dwellings and graves. That evening and the next day I made further examination of Tell-es-Sâfi and came to the conclusion that, though the modern encumbrances will prevent its ever being exhaustively excavated, it is workable. In his brilliant work at Tell-el-Hesy Dr. Petrie never touched the top of the mound, but dug around its sides only. While my more detailed excavations, of course, greatly supplemented his work they did not materially affect his theories. If work around the unencumbered slopes of Tell-es-Sâfi will yield as good results as those obtained by Petrie at the other Tell they will be worth while, even if we cannot dig into the heart of the mound.

Before proceeding north the next day to the railway station at Sejed we made a detour to the west to examine Tell-et-Turmus, which struck me as unimportant. On studying the

map when I returned to Jerusalem I found that Tell-ej-Judeideh, Tell-es-Sâfi, and Tell Zakarîya could all be included in the 10 square kilometres by allowing for a square kilometre around each Tell, and by drawing lines connecting the former with the two latter Tells. Within these lines occurred five ruins: Khŭrbet Dhikerîn, Khŭrbet 'Askalûn, Khŭrbet Nuweitih, Khŭrbet 'Okbur, and Khŭrbet es Surah. Near Tell-ej-Judeideh is a Khŭrbet of the same name, bringing the sites applied for



up to nine. I may state here that owing to the wording of the permit I am not sure whether all these sites are available, but Tell-es-Sâfi and Tell Zakarîya are distinctly granted. The matter, however, is being cleared up.

Owing to the usual routine of business, including correspondence with the Constantinople authorities, who were thus assured that our work in Jerusalem had been conducted satisfactorily to them, the issue of the permit was not announced until within almost a year of our application. At our request

it was dated October 1st, 1898, being available for two years from that date, but in consequence of delay in transmission, arising from the going astray of a letter, the document was not actually in our hands till October 19th. Mr. Macalister and I had been anxiously awaiting its arrival for about seven weeks, and it was a relief to have matters at last begin to move quickly. The permit arrived at the Consulate on a Wednesday. On Friday we were on our way to Hebron armed with a letter from the governor to the Kaimakam of Hebron, who received us very cordially and gave us a letter to the chief men of Zakarîya and Tell-es-Sâfi, requesting them to advance our work in every way. On Saturday Yusif, the foreman, moved the camp to Deir Abân by train, whence he transported it on camels to Tell Zakarîya on Monday, and on arriving at sunset I found it all in order.

My reasons for starting work at this Tell were both diplomatic and sanitary. In beginning work in a new district it seemed wiser to take first an unincumbered site and work here until the people of this part of the country had got used to us and to our work. In the second place Zakarîya is free in the autumn from the malaria which then usually hangs about Tell-es-Sâfi, though since arriving here I find that that place is freer from the poisonous vapours than usual. The village of Zakarîya climbs a gentle slope at the north side of the valley. On Tuesday morning the chief men, with their hangers-on, assembled and seated themselves under the olive trees. I handed the Kaimakam's letter to the Effendi, who handed it to the Khatîb to be read out. A profound impression was created. We hoped to begin work the next day, but a difficulty arose as to question of wages. As this is a charcoal country we had to compete with that trade, which furnishes work all the year round. Again our arrival was synchronous with the olive-gathering, which made the people quite independent. At Tell-el-Hesy we paid a little over half the Jerusalem rates for labour, but here the rates average about three-quarters.

Work was begun Thursday, October 26th, with only a few labourers, as it was necessary to train them in, so that on Saturday we paid off only 18. By the next Saturday the number had grown to 32, and on the succeeding Saturdays the numbers were 57, 68, and 65 respectively. The men vary

much in intelligence, but we have trained in one first-class miner. On the whole they come under discipline very well, as those who quarrel are instantly turned off. For three days Yusif was on sick leave, and I had charge of 50 men and boys deepening an area 80 feet by 20, with several men at other points. What with boys jostling against each other as they hurried to and fro with their earth-laden baskets, with big stones cast up from the pit, with clouds of dust flying, I wonder such good nature prevailed. The arrival of the water jars brought up from the fountain on a moth-eaten donkey, driven by a gentle old lady, usually caused a sudden dropping of picks and baskets, until, throwing my overcoat over the jars, I declared that they were sealed with my own seal till lunch time. At first the weather was extremely hot, then the temperature dropped, but high winds prevailed, rendering work on the most exposed parts of the hill impossible, then came fierce rain-storms, which interrupted our work three days one week and two days the next, while the soft land on which we were encamped became a plain of mud. But now delightful weather has set in and we have moved our camp to an olive-grove where the soil is firmer.

We may now proceed to a sketch of the work done here this short season. While the survey of the slopes of the Tell is not yet complete, that of the summit has been finished and a plan is submitted. The summit of Tell Zakarîya is in the form of a rude triangle, trending north-westwards from its base. It consists of a plateau having a distinct edge, as marked on the plan, below which on every side the land falls rapidly, although here and there the fall is broken by broad terraces, which are proved by the pottery strewn on their surfaces to have been occupied. At the south-east corner of the hill there is a raised mound, rising from 19 to 23 feet above the plateau level. The extreme length of the plateau from Tower I to the "road down hill" is about 1,000 feet; its greatest apparent breadth (along section E—F) is 440 feet; pits sunk in the raised mound have shown that the rock underneath it is not much higher than the general level of the plateau, hence the greatest actual breadth of the latter, in a line taken from Tower II across the "rock outcrop" and along the mound, is 500 feet.

The lowest level of the plateau is at a point on the edge at Tower II, which is taken as the zero point in marking levels. A glance at the plan will show that from the line E—F to the apex of the triangle the summit is fairly level, while south of E—F the surface is more irregular. The relation between the present surface and the rock was determined by a series of 16 shafts: three sunk along the line A—B, five along the line C—D, and eight along the line E—F. It will be seen that the present surface line of *débris* follows approximately the rock contours, except at the west side, where the *débris* runs level to the edge while the rock has a gentle slope. The *débris* is usually in two distinct layers. The first, resting on the rock (except at one point, where the red virgin soil was found), is from 2 to 10 feet thick and consists of hard, dark-brown soil. Above this there is invariably a stratum of light, grey soil, ranging in thickness from 4 to 9 feet. Layers of fallen stones occur at different depths. A careful record was kept of the pottery found at the various depths, and the results are marked on the sections by the initial letters in Lombardic characters:—A, denotes the Archaic ware, called Amorite by Petrie; P, denotes Phœnician; J, Jewish; G, Greek; and R, Roman. In the case of a mixture of styles, indicated by two or more letters, the first letter denotes the predominating element. A prefixed x denotes that only an individual specimen of the type was found; xx denotes two specimens. Two short horizontal lines = denote approximately the level at which the style of pottery was observed to change. The predominant types found in the higher stratum are Jewish and Phœnician. Among thousands of sherds only a dozen bits of Roman ware were found. In the three pits sunk along the line A—B, however, the Archaic types appear to predominate. While Jewish and Phœnician types occur in the hard, brown, or lower stratum, the prevailing types are Archaic, occurring at several points exclusively for several feet above the rock, thus showing an undisturbed stratification. A solitary bit of Greek ware occurred in this stratum.

Remains of buildings *in situ* were seldom struck in the 16 pits. A rude mud flooring, 4 to 5 inches thick, was found

plainly *in situ* but broken, at a depth of 5 feet near E, and a somewhat smoother floor, also of mud, above the burned layer to the right. In the midst of section C—D occurred a stone pavement, much settled and cracked by fallen stones, with house-wallings of rude stones. On the pavement were numerous potsherds, Phœnician styles mingling with Archaic types, which predominated. Near the rock in the middle of section A—B a pit-oven built of mud occurred. A very well made cup mark was found in the rock, and several scarps occurred, probably old quarries. Traces of rude foundations crop out from the surface at the north end of the plateau, but an examination of the most important one proved it to be merely superficial, one course of stones laid on earth. From the paucity of building remains in 16 small pits sunk on this large plateau, we cannot infer that buildings do not exist at other points. While sinking several trial pits on the raised mound before opening our large clearance, we were disappointed with the lack of traces of good masonry, but on making the clearance itself we found plenty of remains.

We have noticed the distinct edge to the plateau. This is a feature common to many artificial mounds, whose tops are comparatively flat, such as Tell-el-Hesy, Tell-el-Mutasellim (Lijjûn), &c., and from this fact alone we cannot argue that Tell Zakarîya was artificially levelled. The sides of the pits along the edge were carefully examined, but in only one case did the light grey soil show the angle of shot rubbish. However, a study of the three towers found at the south-west inclines us to the opinion that some levelling took place at the latest period of occupation. The lines of the three towers are distinctly traceable in one course of stones cropping out from the slope. These stones are much weathered, but were apparently once well-squared (notably at the tower angles), and are fairly large, ranging at Tower II from 9 to 18 inches in height. On trenching around the walls we found that the masonry *below* the surface of the slope consisted of rough random rubble, laid in mud, and set so irregularly as to strongly suggest that they must always have been below ground. At Tower II the rubble is distinctly smaller than the stones which appear above the slope. Towers I and II project from the edge, while Tower III projects from

the slope a few feet below. Their faces vary from 18 to 19½ feet in length. They presumably are set on the rock, as they were found to descend as deep as we dug. From Tower I a rude wall similar in construction to the underground rubble of the tower itself was found running north-west towards Tower II, the roughness of construction preventing our deciding whether there was a bond or not. It is not set in the rock: only a few courses appear, buried under the slope. No wall runs off from the other side of the tower, the latter having a distinct corner. In a long transverse trench between Towers I and II we failed to find a continuation of the wall just mentioned, but struck a rude flight of steps leading into a rudely built chamber through an opening about 4 feet wide, with a rude mud flooring, some 7 feet below the edge of the plateau level. However, from the north side of Tower II a similar wall, buried by the slope, and not resting on the rock, was found running towards Tower III. It is 11 feet 6 inches thick at the top, but narrows as it descends. This was picked up 21 feet beyond, and traced for 7 feet, where it appeared to return at right angles in a wall 2 feet thick. At the south-east angle of Tower III a rude wall, similar to those described before, was found, while the absence of a wall on the other side was proved. No traces of other towers were observed to the north, though superficial search was made.

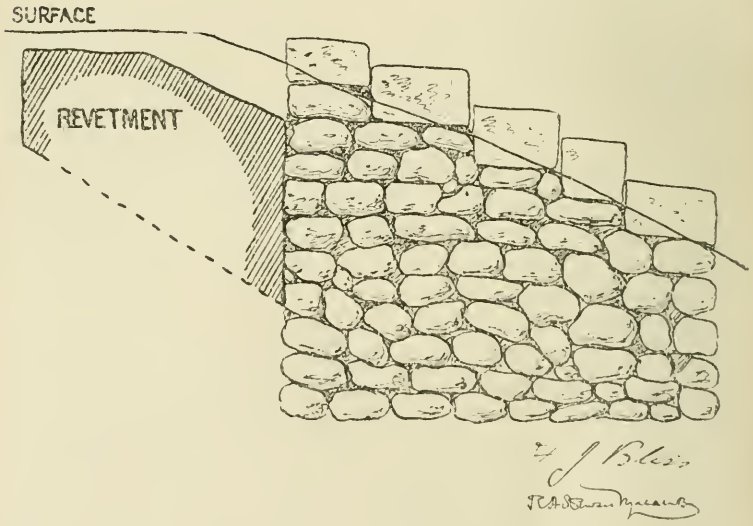
In arguing as to the relation of the constructions described above, I would start from the assumption that the ground-line of the three towers at their time of building was the line of the present slope, as supported by the difference of masonry above and below the slope. As the walls running from the towers are apparently of the same date with those towers, and as these walls are buried by the slope which appears to be unchanged since the towers were built, it would appear that these walls were erected in places as a sort of revetment or retaining wall when the edges of the plateau were levelled and then buried by the slope formed over them. They never appeared above the surface, and did not connect the towers, as their absence in places under the presumably undisturbed slope shows. The towers thus rose isolated from the edge of the plateau at its south-western corner, at a point where, as the

contours will show (when the survey is complete), attack was to be dreaded. The steps leading to the rude house between Towers I and II would, according to this view, antedate the towers and the formation of the slope.

The eastern slope is faced with a lining of stones roughly coursed, found in one place to be laid in two thicknesses. This lining suggests the glacis found by Petrie at the south end of

TELL·ZAKARÎYA EXCAVATION

DIAGRAM SHEWING THE CONSTRUCTION OF THE REVETMENT TOWERS



Tell-el-Hesy. The western slope to the north of Tower III is interrupted a few feet below the edge by a terrace marked on the plan, above which traces of a similar lining appear. As the terrace trends downwards we thought it might be a road, but, trenching across it, we found nothing to support the hypothesis further.

As the main building occupying the raised mound has not yet been fully traced I must leave details to the next report,

confining myself here to a few general statements. When we first arrived only a course or two of part of the west wall were visible above ground, but the walls, wherever tested (except at one point where a breach had been repaired), have been found to rest on the rock, standing in some places about 20 feet high. The walls are 4½ feet thick, and consist of rubble. Six towers have been found, built of drafted masonry, some of which are a later addition, as they project from the building without bond. Except at the south-east, where the test has not yet been made, all have been found to rest on the rock. The tool used in dressing the drafts is a broad chisel, no signs of the comb-pick being observed. Several cross walls have been found running east from the west wall, but only one of these rests on the rock. Another blocks up the entrance from the building to the central west tower, thus furnishing a sign of three periods, as this tower is an addition to the main wall. The length of the north wall, measured along its inside face, is about 100 feet, and the length of the west wall about 160 feet. The south and east walls are very much ruined, but it seems improbable, from our investigations, that a central south tower ever existed. In our large clearance inside the building we have found walls at different levels, pit ovens, a vaulted cistern, vats, and other interesting constructions to be described later. The average accumulation of *débris* above the rock is about 14 feet.

We were led to begin our large clearance in consequence of the testimony to the antiquity of the site furnished by the pottery. It seemed to us that every cubic foot of the soil was ancient and might be precious. The pottery resolved itself into five types :—

(1) *Archaic Ware*, called by Petrie *Amorite*.—With the exception of the *peculiar spouts* all the types described by him in his "Tell-el-Hesy" were found, namely :—(*a*) Ware with *comb-facing ;* (*b*) *ledge-handles ;* (*c*) *thick-brimmed bowls*, with *pattern-burnishing* on the inside; (*d*) ware with *fine polished facing ;* (*e*) *thick vessels* of light brown, black brown, and drab ware (*see* Nos. 78 to 74, &c., in his book, Plate VI). The majority of types were such as were found by me in Cities II and III at Tell-el-Hesy, dating approximately from 1550 to

1400 B.C., and showing a period when the Archaic forms of pottery merged into the Phœnician styles.

(2) *Phœnician Ware* (*see* Petrie's "Tell-el-Hesy," Plates VII and VIII).—(*a*) The predominant types found by us are similar to Nos. 106–114, 116–125, and 137 in Petrie's book. At Tell-el-Hesy these shapes were found in rough, light brown ware, which occurs here, but usually gives place to rough reddish ware and to smoother yellow ware. The lamps and bowls may be also seen in my "Mound of Many Cities," p. 87. Among these may be seen vessels with a lip, and a cup in the centre; one fragment of the latter type has been found here. (*b*) The bowls painted in bistre, with handles in the form of a wish-bone, also occur (Petrie, Nos. 150–157). (*c*) Several fragments of the thin black flasks (called bilbils) have turned up (Petrie, 115, 138, 141, 144). (*d*) The pottery with patterns (Petrie, 163–183) also occurs and belongs, according to Petrie, to the period of the Phœnician predominance in pottery.

(3) *Jewish Ware.*—Of the types shown in Plate XXV of my "Excavations at Jerusalem, 1894–97," we have found here Nos. 1, 2, 4, 5, 6, and 11. The most common are the lamps with stands (No. 1), and the cooking pots (No. 2), which were very common at Tell-el-Hesy. I also have observed many fragments which appear to belong to vessels similar to Nos. 230 and 235, figured on pp. 118 and 119 of my "Mound of Many Cities." In connection with the Phœnician and Jewish types just described were found forms new to me, to be detailed later.

(4) *Greek Ware.*—(*a*) One fragment of Ægean glazed ware. (*b*) One large loop-handle, and many ribbed bowls, both relegated in Egypt to the seventh and sixth centuries B.C. Of the same date are the lamps with broad brims, being a development of the Phœnician lamps. (*c*) Several fragments of black and yellow polished ware (550–350 B.C.), including spouts of lamps.

(5) *Roman Ware.*—Fragments of the ordinary ribbed types occur in the great clearance to a depth of about 7 feet, but form an exceedingly small proportion (not more than 2 or 3 per cent.) of the whole number of fragments, which are mainly Jewish and Phœnician to that depth, with a very small admix-

ture of Archaic types. In trenching around the outside walls of the enclosure no Roman ware was found.

The great clearance is about 15 feet deep. The pottery to a depth of 7 feet has just been shown to be a mixture; this continues to a depth varying from 10 to 12 feet, but Roman ware is absent, while the proportion of Archaic types somewhat increases. From a depth of 10 or 12 feet to the rock the Archaic types are found almost exclusively, the exceptions including a few fragments of Jewish, Phœnician, and early Greek types. We thus appear to have three strata of pottery:—(1) An Archaic stratum on the rock, slightly disturbed in pre-Roman times. (2) A stratum much disturbed in pre-Roman times, but probably after the Archaic period. (3) A stratum disturbed in Roman times.[1] Our clearance pit, marked out to include an area 80 feet square, is being worked in four sections—80 feet by 20 feet each. We are now completing the second section, throwing back the *débris* into the first, which has been carefully planned with all its remains. The observations on the strata, made by examining thousands of potsherds in the first section, have been continued in the second, and will be further tested in the third and fourth. The remains in the large clearance (walls, tanks, cisterns, vats, pit-ovens, &c.) will not be described until it has been completed, when the relation of these constructions to the enclosing building will probably appear. From all the facts at present available, we gather that the main building, with its towers, certainly antedates the Roman period, though it is not improbable that Roman settlers made use of it. That such settlers had their main habitations on the slopes of the hill is suggested by the fact that some of the lower terraces are thickly strewn with Roman ware, so scarce on the summit, as well as by a pavement of *tessera*, broken, but plainly *in situ*.

After several years' experience of digging in Palestine soil, I have come to the conclusion that, owing to many conditions which need not be detailed now, antiquities are exceedingly scarce, and that the only hope of finding these is, first, to

[1] The discovery of a single fragment of a Byzantine lamp at a depth of 9 feet proves no more than that some one dug a pit on the top of the Tell in late times.

choose a site that is proved to be ancient, and then to turn over great quantities of soil on that site. Tell-el-Hesy is a stratified mud-brick town, and the planning of the eight superimposed cities gave the work there a peculiar value, but apart from the pottery, which, fortunately is found on every ruined site in great quantities, and which at Tell-el-Hesy served as a basis for dating the various occupations, the objects confirmative of the age of the mound were most disproportionate to the amount of soil turned over. In over 750,000 cubic feet of soil examined what was found? Eleven scarabs, five cylinders, two statuettes in metal, about 100 metal weapons and tools, three inscribed pieces of pottery, a few beads, many stone implements, and one cuneiform tablet. Turning to the 50,000 cubic feet of soil examined thus far at Tell Zakarîya we notice that the number of objects found compares most favourably with the proportion at Tell-el-Hesy. They include:—(1) Many stone implements (worked flints, corn-grinders, hammer-stones, pestles, mortars, &c.): (2) several pins, needles, arrows, chisels, &c., in iron and bronze: (3) a jar broken but *in situ* on the rock, containing over 80 carnelian beads of various shapes, including small unfigured scarabs, a quantity of small beads made of paste, a tiny figure of Bes (?) and two other Egyptian emblems, three figured scarabs, one defaced but apparently containing a cartouche of the XVIII dynasty, &c.; (4) a curious scarab, having an XVIII dynasty cartouche on the rounded back, as well as signs on the flat part, found on the summit of the Tell; (5) a sinker-shaped seal of stone, figured: (6) another small Egyptian figure of blue paste; (7) three coins, one Jewish, found at the depth of about 5 feet; the other two are much corroded, one found on the surface, the second at a slight depth. The general absence of coins is significant. When I remember, first, that the site of Tell Zakarîya must always have been strategically important; second, that the range of pottery includes the period of the Tell-el-Amarna and Tell-el-Hesy tablets, and hence that in turning over the *débris* we may any day come across such relics; and finally that owing to the absence of modern houses and graves we have here practically a free hand, then I not only feel encouraged to complete the large clearance already marked out, but also

have a desire to leave none of this ancient *débris* on the Tell untouched.

At the present stage of the excavations at Tell Zakarîya it is somewhat early to say much about its identification. In his discussion of the site of Gath Dr. G. A. Smith [1] shows that it must have lain inland, upon the borders of Hebrew territory, on the route of the flight of the Philistines after the battle of Shocoh, and probably near to Ekron. These requirements are about equally balanced in the cases of Tell-es-Sâfi and Tell Zakarîya. Both are inland. The Vale of Elah, along which the flight took place, sweeps around the east and north sides of the latter, and enters the plain close to the former. Tell Zakarîya is closer upon the border of Hebrew territory; Tell-es-Sâfi is nearer to Ekron. Gath disappeared from history about 750 B.C. The Jewish pottery, which seems to be the latest at Tell Zakarîya, with the exception of an infinitesimal proportion of late Greek and Roman types, ranges at Tell-el-Hesy from 1,000 to 400 B.C. This report has confined itself to the excavations. However, Tell Zakarîya presents an extraordinary series of rock-cuttings which we have as yet only partially examined. A general description of these has been prepared by Mr. Macalister and is forwarded by this post. I have never examined the caves at Beit Jibrîn, but I gather from the descriptions that some of the rock-cuttings here resemble them in some particulars.

TELL ZAKARÎYA, *December 3rd*, 1898.

THE ROCK-CUTTINGS OF TELL ZAKARÎYA.

By R. A. STEWART MACALISTER, M.A.

THE remains of rock-working, with which Tell Zakarîya abounds, may be considered under three heads: cup marks, miscellaneous rock-cuttings, and chambers.

A. *Cup marks.*—Of these I have noticed a considerable number, and it is highly probable that more remain to be

[1] "Historical Geography of the Holy Land," p. 174, &c.

found. They are of the characteristic half-melon type which I have observed at El-Mediyeh also; very different from the flat saucer to which I am accustomed in Ireland. By a happy accident one of our trial-pits on the summit plateau struck upon a cup mark, 10 inches in diameter and 9½ inches deep, cut in the rock-surface. This fortunate discovery supplies us with an indication of the period to which these markings are to be assigned. The *débris* had accumulated above it to a depth of 10 feet 6 inches, 3 feet 6 inches of which was the dark hard soil that, for the most part, contains early types of pre-Israelite pottery. This fact at least admits the possibility of the cups being the work of a race which in the occupation of Palestine preceded the tribes so often enumerated in the Pentateuch.[1] I carefully examined this specimen, in the hope that, having for so long been protected from the weather, it might preserve some indication of the nature of the tools employed in its formation, but in vain; it is worn as smooth as those which have always been exposed to the air.

I have observed one case only of a cup associated with other rock-cutting. In this example a ring is cut on the stone, not, as usual, concentric with the cup, but so that the cup lies on the circumference of the ring.

B. *Miscellaneous rock-cuttings.*—Of these there are several capable of being classified as follows :—

1. Scarps.—These are for the most part apparently quarries, though few are as much as 3 feet deep. Their presence in considerable numbers is sufficiently accounted for by the requirements of building material for the large building on the hill-top. Some of them are apparently associated with the chambers to be described presently, but the juxtaposition may be fortuitous.

2. Vats.—Of these there are two, apparently part of the "plant" of an olive or wine press. One is in the rock outcrop west of the main building on the summit plateau; this measures 6 feet 6 inches by 4 feet. The other, which measures 5 feet

[1] I avoid the term "Amorite," commonly applied to these tribes, as being too specific to denote peoples who, though associated geographically, may for all we know have been of widely diverse ethnological affinities. The term "pre-Israelite," though not wholly free from objection, seems to me preferable.

by 3 feet 3 inches, and is 2 feet 6 inches deep, is a little above the *col* connecting the Tell with the next hill to the south. In the bottom of each is a receptacle shaped like a cup mark.

3. Steps.—I have observed two short flights of steps cut in rock-surfaces. Their purpose is still obscure.

Besides the rectangular vat referred to, the rock outcrop on the plateau contains a large circular vat, about 3 feet in diameter, apparently part of the same system; a semicircular scarp; four conspicuous rectilinear scarps; and three large and several small cup marks. A few trial pits in the neighbourhood of this outcrop will determine whether similar works are covered by the earth in the neighbourhood, and will thus indicate the relative age of the rock-cuttings and the plateau. If there be no working under the present soil, or if the rock rise suddenly to the outcrop (so that the latter was difficult of access before the plateau was formed), then in all probability the plateau is earlier than the rock-cutting, and *vice versâ*.

c. *Chambers.*—The outline descriptive catalogue here presented must be regarded as merely preliminary to a more detailed account; and I cannot claim even that the list is complete, as others may still await observation. The entrances are rarely conspicuous, and sometimes seem to have been intentionally obscured. As many of them cannot be entered without a crane, and as we have as yet been unable to spare men, time, or material from the important works of the hill-top, I have had to be contented with an inspection through the entrance hole in several cases.

They will be found to fall into several classes, and probably belong to widely different periods; but in the present list I prefer to follow the topographical order, as it might perhaps be found that fuller investigation would shift individual examples from one class to another. I will, therefore, merely indicate the broad lines of subdivision here. Several, being fitted with loculi, are certainly sepulchral, and these fall into two groups in which one contains long loculi for inhumation, the other the small cell loculi of an ordinary cinerary columbarium. One at least was in all probability used for residence, and there is an indication that another was at some time used as a place of Christian assembly. There remain a considerable

number whose purpose must for the present remain undetermined. Only a very few were unquestionably cisterns.

Those who have seen the Royston cave in Hertfordshire will be able to form a good idea of the normal type of these excavations. They are, as a rule, irregularly circular on plan, bell-shaped, and entered by a hole in the roof. Often a staircase runs down from top to bottom, but these are nearly all broken at some point, as though with the intention of rendering entrance impossible—possibly to prevent the cave from being rifled when it was finally closed. A second entrance in the majority of cases gives admission to a narrow creep passage abutting on the staircase at some distance from the top.

In several, narrow creep passages (by no means easy to negotiate) lead from the main chamber to others.

The stone in which these chambers are cut is a white chalky limestone, very friable, except on the outer surface, which has weathered hard. Its disintegration has, in the majority of cases, covered the floors with a thick layer of fine dust, which, combined with the occasional fall of larger stones from the roof or through the entrance, renders the heights of the chambers as given below rather less than was the intention of the original excavators. In all cases "height" or "depth" in the following list denotes present dimension.

I shall describe first those remaining on the hill-top, then in turn those on the southern, eastern, and northern slopes. I have not found any on the western side.

(*a*) *On the Hill-top.*

I. In the centre of the main building, a cistern consisting of a chamber about 6 feet high, approached by a vertical shaft, approximately square, in section of about 1 foot 9 inches bore, and 11 feet length. Not explored.

II. Inside the main building, a chamber, dome-shaped, oval on plan, the long axis (west by north and east by south) 11 feet 1 inch long, the cross axis 9 feet 9 inches. Height of chamber 7 feet 7 inches; an oval entrance, 5 feet long, 2 feet across, and 3 feet 11 inches high gives access to it; a flight of steps, five in number, runs down its northern side from the top to within 5 feet 8 inches of the bottom. There is only one other example

of a staircase not reaching the bottom of the chamber. Two Phœnician jars, placed *in situ*, but empty, were found within the chamber on the floor. It is filled with earth and buried under 13 feet of *débris* inside the main building; a wall runs partly over the entrance. There are traces of plaster on the east and south sides. (This chamber having been submitted to a careful examination has now been closed again.)

III. A cistern found under the north-western tower of the main building, extending from 14 feet to 21 feet below the present surface of the ground. Footholds have been cut in the entrance hole.

IV. On the summit-plateau, at the bottom of a depression in the ground about 8–10 feet deep; a large irregular conical pit, with rapidly oversailing walls, choked with *débris*. There is one entrance in the top and another communicating by a creep at the sides. It is marked "cisterns" on the accompanying plan, but this indication must not be taken for a final verdict on the purpose of the excavation. Not explored.

V. Close to the northern revetment tower, a cylindrical shaft, well built of masonry set in cement; depth 16 feet 6 inches, bore uniformly about 2 feet 6 inches. The presence of an ancient stone trough, as though for watering cattle, makes it probable that this is the shaft of a well or cistern.

(b) On the Southern Slope.

VI. An oval chamber with one entrance in the top and another in the side. The latter is divided into two by a central pillar, but is blocked by fallen *débris*, as is the central hole by fallen stones. No staircase and no loculi are to be seen from the top. The chamber is oval on plan. Not explored. A neighbouring rock shows traces of scarping, and there seems to be the remains of a trough, much broken and weathered, about 20 feet away.

VII. A shaft, 20 feet deep, blocked with stones. Nothing is known of the nature of this cutting. Near by is a small cup mark.

(c) On the Eastern Slope.

VIII. A large columbarium, 17 feet deep, floor diameter about 17 feet. Six rows of crematory loculi are cut in the

walls, those in the third from the top being triangular, the others square. The plan and section are irregular. There is no certain evidence of passages or auxiliary chambers to be seen from the top. There are two openings, one large and lozenge-shaped, the other small and circular; but (exceptionally) neither has the advantage of the other in providing a convenient approach. Not explored. Close by is a large stone trough.

IX. A very large bell-shaped chamber, 25 feet deep. Two entrances, one originally providing access to a flight of steps (which now, however, stops 10 feet short of the opening), the other a hole in the roof. The entrance of a passage, leading into the hill from the foot of the stairs, can be seen from above; its destination is unknown. Not explored.

X. A small chamber, 22 feet long, 5 to 7 feet high. This is very irregular, and is probably a natural cavern.

XI. A circular chamber, now 8 feet deep; there seems to be one or two crematory loculi. Not explored.

XII. A large pit, 26 feet deep, with one entrance only; there is a staircase, but the top is broken. At some time this has apparently been used as a cistern, as deep rope-marks are cut in the side of the entrance. It is to be noticed that these are on the up-hill side of the entrance, not (as would be expected) on the down-hill side; no doubt because the staircase would prevent buckets reaching the bottom of the well if let down from the latter side. No loculi are to be seen. Not explored.

XIII. A large irregular chamber, 16 feet deep. Much *débris* in the bottom. No loculi. Not explored. Close by this is a rock with a well-formed cup.

XIV. The shell of a small chamber, the outer side of which has caved in. It is 7 feet 6 inches high, 21 feet across. The small creep passage which gave access to it remains intact.

XV. A passage, 1 foot 9 inches high at the entrance, and 3 feet across, driven obliquely downwards into the hill side for a long distance. Destination unknown. Not explored.

XVI. A chamber, 27 feet 6 inches across, now only 8 feet high, the roof having fallen in. There are a few crematory loculi, one of them triangular, on the eastern side. A stone

with a hole through it is lying among the *débris* on the floor. The side entrance is 8 feet across and 6 feet high.

XVII. A small chamber, caved in and blocked with *débris*. Two or three crematory loculi are visible in the exposed part of the wall.

XVIII. A very large cutting, approximately circular, 33 feet in diameter, maximum height 5 feet 6 inches. In the centre is a pillar which has been left as though to support the roof; this is about 5 feet by 4 feet, in cross-dimensions. Pick marks are prominent at the inner end; here there is a shelf or step, 6 feet long and 3 feet wide. That this large chamber was intended as a habitation is indicated by the presence of a water groove in the rock surface, around the entrance hole, designed to prevent the entrance of more rain than was unavoidable.

XIX. A small chamber, 17 feet by 9 feet, height now 5 feet 6 inches, but broken and blocked with *débris*. No loculi. There was a creep entrance to it, now blocked.

XX. A very remarkable and interesting crematory columbarium. The principal chamber is irregular in plan, but, roughly speaking, 22 feet 3 inches in diameter and about 12 feet high. The original entrance at the top is now blocked; there appears to have been a staircase from it to the floor, but it is destroyed. The present entrance is not original, as is shown by its interfering with three rows of triangular crematory loculi; it is a hole broken through to a small domed chamber, about 8 feet in diameter, which communicates with the open air. Opposite the present entrance another irregular hole gives admission to a second chamber, now for the most part filled with rubbish, but with crematory loculi so far as the sides can be seen. To the left of this chamber an extremely awkward and narrow opening, about 1 foot 3 inches in diameter, gives access to another apartment. Close by the present entrance is a large squared stone bearing the cup and ring already mentioned. There is also lying near a stone, 4 feet 3 inches long, with a reveal (or possibly a shallow cornice) cut upon it.

Further exploration, which would involve the clearing out of *débris*, would probably reveal fresh facts about the excavation, and might result in the discovery of objects that would throw light on its period. The more easily accessible chambers

in the Tell have long since been rifled, and it is only by excavation in such an example as this that we can hope to find portable antiquities.

(*d*) *On the Northern Slope.*

XXI. A most extraordinary series of chambers, connected by creep passages. They are arranged in two storeys (I suspect excavation will reveal a third), circular holes in the roofs of the lower chambers communicating with apartments above. I shall not here attempt a description of this excavation, which would be unintelligible without elaborate plans and sections: but will content myself by saying that I have already been in 13 of these chambers, and that as from the majority of them creep passages radiate, leading to unknown possibilities, I have no reason to suppose that I have nearly exhausted the series. The inhabitants have stories of the extent of the excavation which one would be inclined to put aside as extravagant were they not so definite. This work merits very careful examination. The entrances to some of the creeps are recessed as though to receive movable doors of wood or stone.

XXII. A composite excavation, much ruined, consisting of the following members:—(1) A chamber, fallen in, 38 feet in diameter, with a blocked creep entrance on the south side. (2) A small domed cell (perhaps merely a natural hole in the rock, but in any case almost entirely ruined). (3) A chamber, 23 feet in diameter, but of irregular plan; three rows of square crematory loculi are visible above the *débris*, which thickly covers the floor. A blocked creep passage leads off at the side; its destination is unknown. (4) A small domed chamber, 7 feet in diameter. At the entrance to this is a small flight of four steps. (5) A domed chamber, at present inaccessible except through the hole in the roof, 20 feet deep; a passage (destination unknown) can be seen from the top. There is a small hole broken between chambers (4) and (5), but it is too small to have been done with intention. Nothing further is known of the extent of this excavation, which has not been fully explored.

XXIII. A large bell-shaped chamber, 30 feet high, 27 feet in diameter at the bottom, approximately circular. There is a

winding flight of steps, broken at the top, with the normal second entrance abutting on it about two-thirds of the way up. At the bottom is a small inhumatory loculus, L-shaped, and a shallow niche, perhaps an incomplete loculus. From beside the steps a most awkward winding passage leads off—destination unknown; beside it is a loculus, with reveal for a movable door, rather larger than an urn-cell, and rather smaller than a receptacle for a body. In the side of the bell, at a height of about 8 feet from the present floor, is cut a short flight of steps giving access to three creeps of unknown destination (one of them is known to lead through a small domed chamber). There is evidence also of the existence of another creep below these; while yet another, choked with *débris*, leads off the passage connecting the secondary entrance with the staircase, and possibly uniting this system with the great series of chambers No. XXI.

XXIV. The remains of three chambers arranged round a fourth; the latter has caved in, and, with one exception, all the chambers are much ruined. This is dome-shaped, with a circular hole in the roof, and is about 10 feet in diameter, but the floor is raised by *débris*. A blocked creep passage, of unknown destination, leads from it. The main chamber is about 40 feet across. Of the other two, one seems to have been square in plan—the only example of this shape hitherto observed. From the other a creep passage leads off, at present impossible to explore. Beside this group is a hole in the ground—the entrance to a fifth chamber, probably associated with the rest, but choked up.

XXV. A hole in the ground, choked up and grown over with weeds. A creep passage, also choked, leads out from it. Not explored.

XXVI. This imposing work consisted of a large chamber, about 110 feet in diameter, which has now entirely caved in. In the centre of the back wall is a large opening giving admission to a creep passage, which, however, does not extend far. To the right is a small domed hole sunk in the ground, with the usual secondary entrance; this is blocked. A passage leads off close to this, and bifurcates, one ending in a hole running up to the entrance and an inhumatory loculus, the

other to a similar loculus, or possibly a creep passage. To the left of the principal chamber is a very complicated group of passages, chambers, and sub-chambers, impossible to describe intelligibly without the assistance of sections. This group of caves is a very conspicuous feature of the north side of the hill.

XXVII. A circular chamber, not of large size, too ruined to be described satisfactorily.

XXVIII. A large crematory columbarium, 30 feet deep. It is entered by a square opening, which communicates on the right with spiral stairs of the usual type: these, however, break short about half way down, and the bottom is not accessible. There is also a hole in the top of the bell. Stairs can be seen rising from the floor, but whether they lead to a creep or not cannot be ascertained without entering the chamber.

The square entrance hole first mentioned also gives admission to a smaller chamber, not easily entered without excavating, but apparently not of much importance.

XXIX. A large crematory columbarium, of irregular plan (approximately rectangular with one semi-circular end). The loculi are for the most part triangular. The secondary entrance is of large size, and its sides are also fitted with loculi. There is a second chamber, with independent entrance, filled with *débris* and much ruined.

XXX. Below No. XXVI, the entrance to a chamber, completely blocked.

XXXI. A large cuspidal chamber, 33 feet across; there are three inhumatory loculi in it. The floor is much raised by the accumulation of *débris*.

XXXII. Above No. XXVI, a domed chamber with a hole in the roof, but no other entrance: partially filled up with *débris*.

XXXIII. A large chamber, an irregular oval on plan (about 24 feet by 38 feet). There are steps all the way from the entrance, which are worn smooth at the top. The depth is 23 feet. A second chamber, 20 feet in diameter, and now 7 feet 3 inches high, breaks into it at the top. There are triangular and square crematory loculi in the latter chamber, which has two entrances, one circular, the other rectangular.

XXXIV. A chamber with an approach to it (?) scarped in the rock, but all is too much overgrown and covered with *débris* to permit of its being described.

XXXV. A large well-cut circular bell-shaped chamber, 26 feet in diameter, 23 feet deep. Its staircase is practically complete. The entrance is a well-cut rectangle, 9 feet 6 inches by 3 feet, and has apparently been prepared for a door. Beside this chamber is a cavity cut in the rock with water-drains leading to it.

XXXVI. A circular chamber of large size, but so full of *débris* as not to be worth measuring. It cannot be entered without a crane.

XXXVII. A large oval chamber, 28 feet 6 inches across, 22 feet high. It is provided with a practically unbroken staircase. Two Latin crosses are cut on the side, and also an emblem (?) in a circle, half of which has intentionally been hacked away.

XXXVIII. A small domed chamber with a single hole in the roof. It is too ruined to be worth measuring.

XXXIX. A double-entranced chamber, beside the last-described. This is 13 feet across and 12 feet deep, but the ground is raised considerably by the accumulation of *débris*. There is a series of crematory loculi of unusually small size in this chamber.

XL. A bell-shaped single-entranced chamber of the ordinary type, 30 feet deep and 30 feet across. Handholds are cut in the wall along the line of the staircase, which is practically uninjured.

The above completes the series so far as it is known to me as yet. As we pass the chambers in review several problems confront us for solution. Are we to believe, for instance, that the gigantic well (No. XXIII) was cut merely to provide admission to two loculi and five narrow passages whose united apertures do not occupy one-hundreth part of the whole wall surface? How are we to reconcile the early date, indicated by the occurrence of an undisturbed stratum of pottery dated 1500 B.C. above No. II, with the late date suggested by the columbaria: are the crematory loculi secondary additions or are

the chambers containing them entirely later works? Why was the awkward creep passage system of communication adopted, and how were the enormous and obvious difficulties of excavation attending their use surmounted? These and other questions demand solution. Sufficient material has not yet been accumulated to justify us in attacking the problems thus indicated; but I have, I think, said enough to show that, even did Tell Zakarîya not possess the archæological attractions set forth by Dr. Bliss in the foregoing report, its extraordinary series of rock-cut chambers would imperatively call for scientific attention.

NOTE.—The library available in a camp is necessarily too limited to enable questions of identification to be entered into thoroughly: but for various reasons, which I hope to be able to develop later, there seem to be grounds for equating Tell Zakarîya, the site of our present excavations, with the Azekah of Joshua x, 10. It is as well to mention that, in suggesting this identification, I attach little or no importance to the superficial similarity of the names Azekah and Zakarîya! Dr. Bliss has already written on the possibility of identifying the site with that of Gath.

REPORTS BY DR. CONRAD SCHICK.

I. *Deir ed-Dosé, or the former Convent of Theodosius.*—The ruins of this convent are situated on the range of mountains to the right of the Kidron Valley south-east of Jerusalem and about 5½ miles distant. In 1879 when travelling to and fro in the Wilderness of Judea, east and south-east of the Holy City, to find out as much as possible all the sites of former eremites or anchorites, I came to this ruin, which I have described in the "Zeitschrift" of the German Palestine Society, 1880, p. 34, No. 22, and put down on the map added to the descriptions of 29 places. I furnished also a plan of Deir ed-Dosé (Plate II), called on it "Ubedieh," as the Bedawîn call the place. This is the name of their tribe, which they give to the ruins because they use them for storehouses, and have near a place of worship, "Sheikh Khalife," a Moslem Makam.

In the "Name Lists," p. 303 (Survey of Western Palestine), the place is mentioned as "the Ruins of the Monastery of the Son of Obeid; also called Mar Theodosius," and in "The Memoirs," vol. iii, p. 111,

(To face p. 36.)

THE GREEK CEREMONY OF LAYING THE FOUNDATION STONE OF DEIR ED-DOSE.

(From a Photograph by Bonfils.)

BRIDGE ACROSS THE JORDAN.

(To face p. 37.)

called Kh. Deir Ibn Obeid, "Ruins of a Modern Village." This latter designation is not sufficient—the ruins are not those of a village, but of a former convent, and only in modern times used as a storehouse for grain by the wandering tribe Ubedieh. Now it seems the Greek convent in Jerusalem had some rights of property in this place, and, having made an agreement with the Arabs to quit it, took possession of it last year. They began to remove the *débris*, and so laid bare the remaining walls, &c., and have begun to build it up again. The laying of the foundation stone, or a kind of resanctifying of the place, was celebrated in a grand manner and before a crowd of people. I did not know of it at the proper time, so I was not present, nor any of my friends who could bring me a proper report, but I have been able to acquire three photographs taken on the occasion, which I send to add to the collections of the Fund. On them will be seen the antiquities found on clearing the ruins, then the assembly, especially the bishop and clergy in their robes, and also a new tile-roofed house on the north-east side of the ruins.

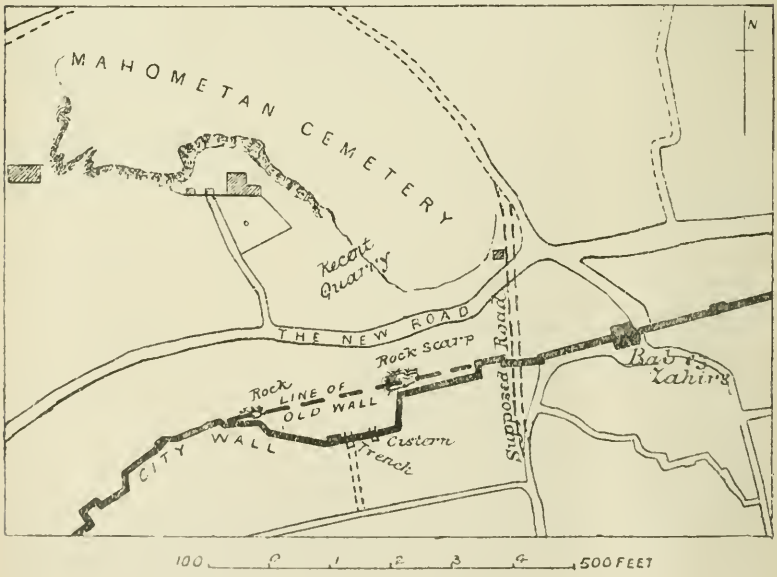
The monastery will be restored, and again become a station for pilgrims visiting Mar Saba, which is a little more than two miles south-east of it. The founder of this old convent was Theodosius, who was born in the year 432 in Cappadocia. He came as a youth to Jerusalem, and was received as a novice in a convent situated near David's Tower, and then moved from there to "the old place" (most likely Mar Elias) on the road to Bethlehem. This place he also left, and went eastward into the wilderness. On a mountain he found a cave, where, according to a tradition, the wise men, when leaving Bethlehem (Matthew ii, 12) stayed a night. Here Theodosius settled, and with some companions built some cells, out of which, by and bye, a great convent arose. There was a pilgrim house, a house for sick people, lodgings and workshops for monks, lodgings for the clergy of various degrees, &c. There once lived in it 693 monks; it was like a city; all trades were represented. The establishment contained four churches, and services were held in various languages. Eighteen steps brought one down to the cave, where the wise men from the east had been. In 1185 the convent had towers like a fortress. In the middle, under the church, covered with a dome, were the tombs of the founder and others. In 1250 it was still mentioned by pilgrims as a marvellous place, also in 1400, but in 1620 it was already deserted, on account of the wild Arabs. Turkoman Arabs took possession of the place, and so it remained until recently.

II. *The Jordan Bridge.*—About two years ago I sent you a photograph of the Jordan Bridge east of Jericho. This bridge was greatly damaged by the swollen river in the winter of 1896–1897, and had then to be mended and restored. I send you a photograph of the bridge as it is now. The passage is on a higher level than the old one, which also can be recognised in the picture. The entrance to the bridge at both ends can be blocked up by doors, and opened when necessary by the watchman and tax-gatherer.

Also I send a photograph of the so-called Jisr ed Damieh, or the ruins of a bridge higher up the river, about where the Nâblus-Salt road crosses the river, but unhappily, on account of water and thickets, scarcely anything can be seen properly. The photographer said there was no place to take a proper view from, on account of the thickets on both sides of the river.

III. *The New Church of St. Stephen.* — In one of my reports I mentioned that the Dominican brethren were building on the old traces of the Church of St. Stephen, outside Damascus Gate, a new church. They did it marvellously quickly, and the shell stood finished about the beginning of the current year. But when snow and heavy rains came in January and February the arched roofing gave way, and one of the pillars began to sink, so in order to secure the new building they were obliged to put on both sides rows of buttresses to the outer walls, giving the building now quite another aspect. Buttresses are found in Gothic architecture, but not in Byzantine, in which this church is built. So, although from a distance it is picturesque, on a near view it looks a little strange.

IV. *The North Wall of Jerusalem.*—As the gate in the northern wall, called Bâb az Zahire, does not open directly to a street of the city, but is



situated rather between two streets, it was thought by many that it was not made by Suleiman in A.D. 1535, when the present city wall was built, on the site of a former gate, but that a new site was selected. When the present carriage-road was made, no traces of an ancient road

(To face p. 39)

were found outside this gate northwards, and it became clear that for such one has to look further west.[1] But no opening in the wall is visible, as there is a high layer of earth, and the opening, or marks of a former opening, would be situated deeper. Above ground there are some large long stones, most likely *in situ*, but not long enough to indicate lintels. Further west, where the city wall makes a large bending towards the inside, stones have been quarried for several years close to the wall. By this, when the earth was removed, it was found that formerly the old wall went through in a straight line, and a trench full of earth was detected under the wall. It was thought that this might have been an entrance through the rock, leading direct by the inner street to Antonia, as the military road. Yet some time later another such cutting was found, a little east of the first, which proved to be a rock-cut cistern, in use before the city wall was built over it; and so most likely it is with the other, which might be proved if the earth were taken out. This cistern, besides other signs, proves that the old city wall stood further out (more north) and in a straight line, as already said and the plan shows.

In the piece of ground where the rock table or block with tombs was found (which is reported in the *Quarterly Statement*, 1897, p. 105) the clearing away of earth is still going on, and a rock-cut cistern has been found.

Inside the city, at its north-eastern corner, the Russians have bought a large piece of ground extending from the large corner in the west eastwards towards "Burj Laklak" (*see* Ordnance Survey plan).

V. *Abraham's Oak at Hebron.*—It is not my intention to give a full history of this remarkable and celebrated tree, which would become rather a long affair, but to say something on its decay and present condition.

When, in the year 1847, I first saw this tree it looked thoroughly sound, green, and flourishing; I detected no damage or mark of decay. But recently, on June 15th, 1897, after 50 years, I saw it again and in a quite different condition as a ruin, making upon me a very pitiable impression—a graphic picture of the vanity of all earthly things, and even of mine own body and life. This decay, although gradual, had come rather quick. In the winter of 1853 a large branch became broken down by the heavy load of snow which had fallen on it. As visitors to the Holy Land wished always to get some particle from this old tree, the wood of this branch was purchased and brought to Jerusalem, where it was worked up into small fancy articles and sold to travellers, who carried them into countries all over the globe. This breaking down of a branch by a load of snow seems to have been the beginning of decay from the inside, although six years later, in the summer of 1859, when I pitched my tent for a week under its shade, I could see no other marks of decay except the missing branch, but the tree looked still green and in the same sound condition as 12 years before. Ten or 12 years later the Russian Archimandrite of Jerusalem bought the tree, with the ground on which

[1] *See* Note by the Rev. Andrew J. Gregg, p. 65.

it stands, from the main road going down towards Gaza, a piece of the shallow valley, and the whole hill with the ruins on its top. So the place became cultivated, and much care was bestowed on the tree. A low wall was built round it and filled with earth to some height and the branches were propped to prevent them breaking down. Notwithstanding all this, in the course of years, one branch after another broke down—once owing to a lightning stroke—so that decay made rapid progress. A few years ago—as the photograph shows—a branch towards the east was still living, but this branch also is now gone. In order to keep this famous old tree in some remembrance, a row of young cypresses was planted in a circular line round it, showing the space which the tree in its flourishing state had in summer at noon shadowed, which, of course, was not an exact circle. As the ground is in some places rocky, especially up the hill, there are for this reason intervals in the line of these trees. It has a sad look, the contrast of the already dead tree, its branches stretching leafless towards Heaven, between and over the fresh green of the younger trees, as behind the cypresses are other trees of all sorts. Even the trunk is barkless, and covered with little wormholes. The time will soon come when this remaining relic will fall, and then a new tree will have to be planted in its place.

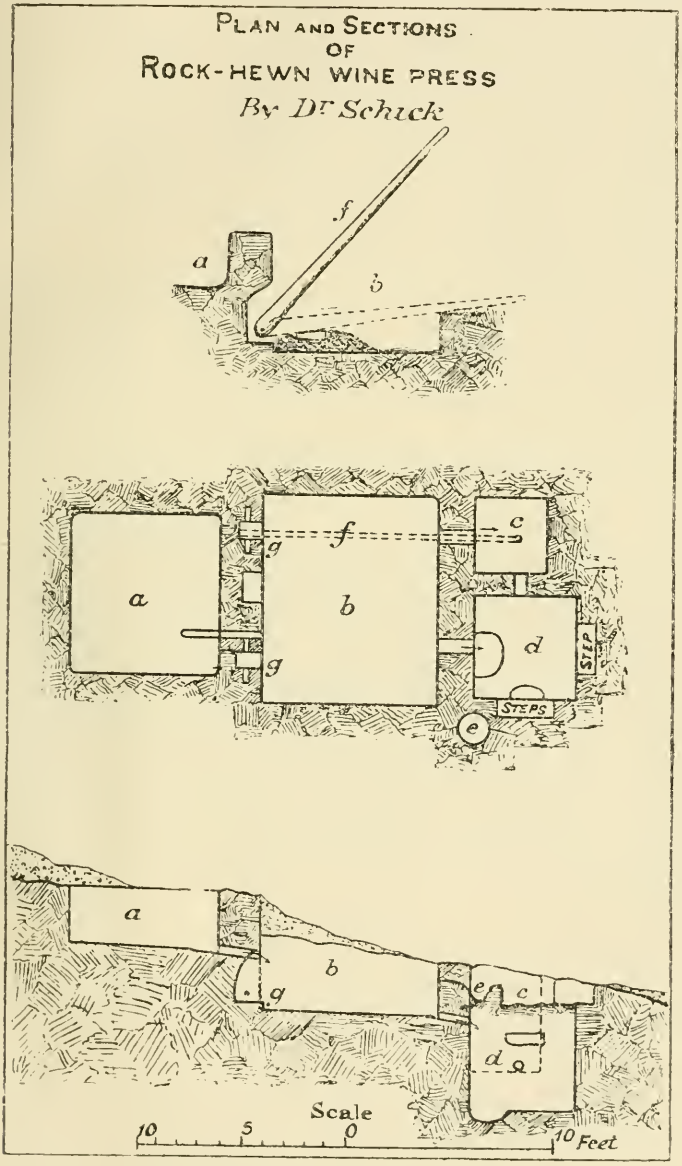
From the place where the tree stands a broad road leads higher up the hill to the rather large and nice and comparatively new Russian hospice, standing on a large and flat rock platform half-way up the hill. Here the key may be got, to go up to the top of the hill, where a look-out tower is built about 36 feet high, from which, on ascending its 45 steps, one may obtain an extensive view towards the Mediterranean Sea and the land of the Philistines. I was told that on clear days even the Russian Tower on Mount Olivet at Jerusalem can be seen, but this I doubt ; at least I could not see it, but the sky was cloudy in that direction. But one thing struck me, namely, to see that in the last 40 years the cultivation of the land, hills, and valleys had made marvellous progress round this site and Hebron in general. Everywhere it was green with vines, trees, &c., and between them are many new houses in all directions. Moreover, wherever I went there was plenty of water to be found either in *biars* (cisterns) or springs, and I could see several rivulets or little brooks. The town itself has very many new houses, so that the former four distinct parts are, by new buildings between, become as one whole. But most of the new houses are west of the Sheikh's quarter, and especially along the road to Jerusalem. The carriage-road I found excellent ; it ends at the eastern quarter, a little below the large pool, which I found full of water. Along this road are kilometre stones put up, with the respective numbers written on them ; at the beginning of the new houses it is 36, and opposite the Haram or the Quarantine—now used as barracks for soldiers—37, and to its end a half kilometre more.

In Hebron the Jews have greatly increased in number. There are now also many Christians, and, as I was told, the English Medical Mission is doing much good. Hebron has no telegraph station—the nearest is Bethlehem.

ABRAHAM'S OAK, HEBRON, 1897. *(From a Photograph by Bonfils.)*
(An iron railing has since been placed round the tree.)

(To face p. 49.)

VI. *Ancient Rock-cut Jewish Wine-presses at 'Ain Kârim.*—A few weeks ago I had to go to 'Ain Kârim with other experts to inspect



a vineyard or piece of ground with some buildings on it. In inspecting and examining things I found two old Jewish wine-presses cut into th rock, and in good preservation. I measured them, and send the accompanying plans and sections of both. They are situated about 100 feet higher than the copious spring of the Virgin Mary, and on the steep slope of the southern mountain about twenty minutes' walk from the spring. On the housetop there one has a fine view of the gardens, the many-scattered houses of the Russians, their Church, the Chapel of Mar Zacharias, and the Convent of St. John the Baptist, besides many valleys and hill tops northwards to Nebi Samwel. One of the wine-presses is situated higher than the other. Both are much alike, but the lower one, of which plan and section are given, is more elaborate.

When the grapes were in some degree trodden and bruised (in *a*) the mass running off could pass into *b*, the flooring of which is 3 feet deeper, and also much wider, calculated to take a much greater quantity. On its south wall, which is situated a little higher, are three niches ; the use of the middle one I cannot tell, but the two side ones are remarkable ; they have each in the lower parts holes on both sides. On consideration one gets the idea that these niches were receptacles for the thick ends of levers, having a strong iron nail across, fitting into the holes, so that the levers might be turned up and down, as shown in the drawing No. 3.

The bruised grapes in the basin or tank, *a*, could run through the hole at the bottom (as shown in the section) into *b*, and when some pieces of wood were placed across, by pressing down the levers the mass could be squeezed and the fluid run away by two holes into the two receptacles, *c* and *d* ; *c* is much narrower than the other and only 4 feet deep, whereas *d* is 5 feet by $5\frac{1}{2}$ feet wide, and $6\frac{1}{2}$ feet deep, having on the flooring at the south side a deepening to enable the remainder of the wine to be taken up. From *c* to *d* is also a round hole, so that the fluid contents of the first might run into the second. This latter has on the north and east sides steps, and on the latter side even a second projecting step, as shown in the plan and section. On the surface of the rock near the eastern step and north-east corner is a round bowl-shaped pit, *e*, where an earthenware jug or *jarra*, as it is called, may be placed secure against tumbling over.

THE LOWER CHURCH OF ST. JOHN, JERUSALEM.

By Archibald C. Dickie, A.R.I.B.A.

This curious little Byzantine Church is situated in Christian Street, near the Pool of Hezekiah, and over it is the more modern Church of St. John, built almost on the same plan.

The present ground level is 21 feet above the floor level of the lower Church (*see* sections), and access is obtained by a rude flight of steps, through the door at the south-west angle of the building. These steps are partly blocked and descend to a vaulted narthex, 7 feet 8 inches by 64 feet 6 inches, which originally had been lighted by a window in the east end. One of the three doorways from the narthex has been blocked up, by a later addition to the walls (*see* hatched walls on plan), which has transformed the original Church into a rather irregular chamber, 16 feet 6 inches wide by 62 feet 9 inches long, with segmental ends at north and south, and having a projecting apse to the east with a floor 6 inches above the Church floor. In the centre of this apse stands a stone-built altar, 4 feet 1 inch by 3 feet 5 inches by 3 feet 4 inches high, the altar stone on top being the whole size of the pedestal and 11 inches thick, while the pedestal is formed of rough rubble building.

A careful study of the masonry shows the extent of the later additions to be a thickening of the east and west walls (*see* hatched parts on plan). This lower masonry does not bond into the earlier walls at the ends and piers (except at pier A, where the courses are continuous, *see* section E, F), and although the two kinds of masonry very nearly course together at an average of 21 inches, a closer examination shows in places a distinct variation of bed joint. At the points where the east and west walls butt against the end walls a straight open joint occurs, showing plainly that the circular walls continue behind the joint. By carefully setting out these points and careful measurement of the segmental ends, I found that a continuation of the circle came exactly to the inside line of the west wall at the door openings and in the same way suited the position of the piers of the eastern apse (*see* plan). The dressing of the earlier masonry is comb pick, while that of the later work shows both comb pick and long stroke tooling, as far as I could judge from candle light, on a sometimes rather decayed surface.

The form of the early Church (*see* blackened walls on plan) is peculiar. The main body of the Church runs north and south and is 62 feet 9 inches long by 24 feet 9 inches wide with apsidal ends, and is divided into three bays, the middle one continuing eastwards and terminating in an apse projecting beyond the east wall of the main part. The four piers around the middle bay are not exactly in the angles of a square, but are near enough to admit of a dome over them, of the characteristic Byzantine style. A spacious narthex, 12 feet wide by 64 feet 6 inches long, formed the western termination of the original Church.

Such details as doors and windows are still more or less uncertain. The filled-up doorway at B in south wall shows that a southern entrance, either from the outside or to another compartment, existed at the floor level (*see* section A, B), and this along with the three western entrances constitute the original scheme of access and exit. From the position of doorway at C in east wall, which seems to lead to a passage, I believe it to belong to the later work.

The window in the north end is the only one now seen, but were it possible to search behind the later masonry, which faces the east wall, there is every probability that the eastern lights would be found. A curious straight joint at D suggests a position for a window between it and the jamb of the later doorway which might be a still later insertion. The absence of a straight joint between the pier, A, and the continuation of its face is difficult to explain, but it is possible that a very ruined state necessitated an almost complete rebuilding of the pier. The recess behind the altar may be taken to show the position of a window, which had been built up at the time of the later restoration. The walls of the apse are covered with plaster so that I was not able to study the bonding of the recess.

It is very unlikely that the inside of the west wall of the narthex is the original structure. Its extraordinary thickness (6 feet 7 inches) seems to suggest that here also a similar thickening to that of the Church walls has taken place. If this is so it is easy to account for the absence of the three western entrances to the narthex, which in this case may be hidden by the later wall—facing, in the same way as the windows in the east wall. The present entrance door is late and has no connection whatever with the early Church, and the steps are also a late insertion. It seems reasonable to assume that the narthex had its three entrances corresponding to the inner doorways, and that at the time of the restoration and building of the upper Church, when the accumulation of *débris* had rendered doors and windows useless, the builders simply built them up when thickening the wall and inserted the present doorway to suit the level of the surrounding ground. I have shown by hatched lines what I suppose to be the later building, and have dotted the early wall with the positions of the doorways, except the south-west angle, which I saw and measured and have shown in solid black.

The whole of the vaulting is late. The centre bay has intersecting vaults, and the end bays have plain pointed tunnel vaults. The ribs in the narthex are irregularly spaced to suit the position of the then existing doorways, and the three bays to the north are vaulted longitudinally, while the others are vaulted transversely.

A glance at the blackened walls on plan, keeping in mind the few hypothetical additions, will show a very complete Church of unusual plan, whose form has been all but lost by a later restoration, effected in the midst of such an accumulation of *débris*, that the builders were forced to relegate the original building to the place of a crypt and strengthen its walls to carry a new structure at a higher level. From

the few details remaining it can well be judged that the design was plain, massive, of good proportions, and of a class of work far ahead of the debased work found in the churches of Eudoxia at St. Stephen's and Siloam. The arrangement of the three apses is happily managed, and the details of doors and windows (especially the south doorway) are simple, effective, and of pleasing proportions, giving a dignity and greatness difficult to conceive in such a tiny structure; and one is left to mourn the ravages of time and discord which have almost entirely effaced such a lovely monument of early Christian Jerusalem.

DISCOVERY OF A SULPHUR SPRING AND BATH ON THE BANK OF THE JABBOK.

By Gray Hill, Esq.

My wife and I were at Jerash in April, 1898, and when leaving, the Kaimakam, to whom we had brought a letter of introduction, sent a horseman with us to show us a bath of sulphur water, which he said had been discovered about a year previously.

It is situated on the south bank of the Jabbok, and close to it at a spot about one and a half hours' ride from Jerash, three quarters of a mile from the ford of that stream on the direct route from Jerash to Es-Salt, and 100 yards east of the junction of the stream which flows down from Jerash with the Jabbok.

There is a round excavation or pit, which formed the bath. It is built round with stones, and the roof has evidently fallen in. The water runs into this from the south side, and bubbles up in several places from the bottom. The overflow passes into the stream through a short passage once well channelled with flag-stones, remains of which exist. The water is cold, and tastes like one of the less disagreeable of the Harrogate sulphur springs.

Mere Hall, Birkenhead.

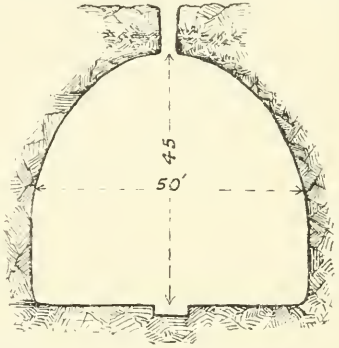
A REMARKABLE CISTERN AND NEWLY DISCOVERED SPRING AT AÎSÂWÎYEH.

By Gray Hill, Esq.

In the valley east of the ridge which stretches from the village of Et Tûr on the Mount of Olives to Mount Scopus are numerous old cisterns cut in the rock, which are in many cases disused owing to want of repair, or from being filled with earth carried down to them by the rains. One, north-east of Et Tûr, which belongs to the village of Aîsâwîyeh, I

assisted the villagers in having cleared out. It took four men over 100 days to empty. It proved to be round in shape, 45 feet deep, and 50 feet in diameter. The rock is hard, so that no cement was required for the inside, and the cistern is so conveniently situated for the reception of water, at the foot of a slope, that it filled with one season's rain. Before this was cleaned out the women of Aîsâwîyeh were going as far as Wady Farah for their water in the late summer, when the village cisterns (half filled with earth) were empty. This is a journey there and back occupying nearly a day. The Sheikh of Aîsâwîyeh tells me there are many old disused cisterns further east. I have seen some of them. The Sheikh also says that there was a small village close to this cistern 200 years ago. There are slight remains of buildings still to be observed.

All this shows that the population, supported by the apparently barren country east of the ridge, must at one time have been larger than one can well believe at the present time. The cost and labour of cutting these cisterns out of the rock must have been very great.



Section of Cistern at Aîsâwîyeh.

The one I refer to appears to be one of the two marked "cistern" in the 1-inch map. There is another large one with part of the roof broken in close to the one in question and to the north-east of it. The two are about 500 feet below the elevation of El Tûr, and you approach them by a path leading from the road between Scopus and El Tûr to Aîsâwîyeh, a little north of the Greek monastery, "Ye Men of Galilee."

I think the cistern is shaped like this; but I did not go down into it, and only looked from above. It is now full of water. I think it holds about 600,000 gallons. There is a little pit in the middle of the bottom and one outside the mouth at top as usual, the latter a catch basin for mud and dirt.

A small spring of beautiful clear cold water was recently discovered by shepherds of Aîsâwîyeh (near to Jerusalem, in an easterly direction), about an hour's walk east of their village, in a narrow ravine opposite to a remarkable cave, consisting of several chambers, and approached by a

very narrow cleft in the rock, which may have served David as a refuge. I think it is 'Arâk Ibrahim, but forgot to ask the name of the cave when I went to see it. The spring and its overflow are below the surface, and the growth of grass above it after heavy rain led to its discovery. The almost entire absence of springs in the hill country between Jerusalem and the Ghor makes this discovery of some interest.

NARRATIVE OF A JOURNEY EAST OF JEBEL ED-DRUSE.

By Mark Sykes, Esq.

On Thursday, 10th March, 1898, I left Jericho, accompanied by my English servant, five muleteers, a dragoman, a native servant, a cook, an Armenian photographer, who was to come one day's journey to photograph the Bedawîn camp, and by Sheikh Fellah, of the Adwân tribe, a nephew of the celebrated Sheikh Goblân, who was formerly a lieutenant under Ibrahim Pasha, when that worthy held Syria. Sheikh Fellah took me to his camp, then situated at El Hammam. The people were wild and interesting. The Arabs, every man of whom carried a weapon of some sort, struck terror into the heart of the Armenian. They dug him in the ribs with a pistol, whereat he wept, upset his camera, and remembered he had pressing business at Jericho. He wanted to return at once, but I persuaded him to take four photographs, from which you may judge the general appearance of Bedawîn and their camp. I was told of the ruins of a bath, to which I was taken; it turned out to be a hot spring bubbling from the midst of weeds. There was a powerful stench of sulphur and of other things even more disagreeable. I was told the following legend about it. The spring has always been here. It was here when our fathers' fathers came here, and the people who were here before told them there was a spirit in the spring, and that no one must bathe in it or take water from it without giving a present to the spirit. There are plenty of traces of rice and eggs round about it. When a Bedawy is sick, he kills a lamb, throws some of it into the spring and, with the assistance of his friends, eats what is left. His friends then force him into the water, clothed as he may be, and he comes out cured. The pool is about 7 feet deep.

There are traces of masonry in the neighbourhood of this spring, but as it was now almost sunset I returned to my camp. I found that one of the muleteers was what my dragoman called "plenty sore with one fever," and gave him some quinine, which cured him in three hours. On the following morning I returned to the spring to examine the masonry. I found some pottery and part of a glass bracelet, which

may be of use in determining the date of the building which stood there. On returning to the camp I found Sheikh 'Ali, Sheikh Fellah's nephew, who invited me to lunch with the tribe, an invitation which I accepted. The food consisted of a huge bowl of meat and rice, into which I and another guest, who was a holy derwish, first dipped our hands. The holy man showed no dislike to eating with so ill-omened a kafir as myself, but told my dragoman that he had known an Englishman with a long beard who spoke Arabic, had read all Arabic books, and wrote night and day without eating or sleeping, and whom he had nursed at Salt during an illness. His name was Richard Burton. In return that evening I invited the two Sheikhs, 'Ali and Fellah, to dine with me. Fellah is a great friend of the Franciscans, having a room of his own in their convent at Jerusalem, and so had learnt the use of knife and fork, but 'Ali, true son of the desert, was much puzzled by the Frankish eating tools, and invariably took the spoon from the dish for his own use.

Next day I said good-bye to the Bedawîn and their camp; and after an interesting ride arrived at 'Arâk-el-Emir, which is the palace of Hyrcanus, whose history is unknown to the Arabs. The following legend is told of some ruins a little higher up, named Aser el Abid. A certain emir once lived at 'Arâk-el-Emir. He had a beautiful daughter and a huge black slave. Wanting to make the pilgrimage to Mecca, he left his child in charge of the slave. When he had been gone some weeks the slave thought he would marry the daughter, and build a large tower to keep her safe. But his master had one night been roused by an angel, who said: "Go back to your home, for your daughter will be taken by Säid the slave as a wife." The emir turned homewards and when he reached a crest of the hill on the eastern side of the valley, he saw the tower nearly finished. He cried out: "Oh! slave, oh! Säid," in a loud and fearful voice, and again: "Oh! slave, why hast thou done this thing?" The slave heard his master, and being seized with horrible fear fell from the top of the tower and died, and the emir going to the tower found his child safe and sound, and took her to his own home.

About two miles from 'Arâk-el-Emir lies Wady es Sir, which is a gorge about a mile and a half long, with a Circassian village at its head. On the right hand side, as one rides from 'Arâk, and about 150 feet from the ground, is an extraordinary house cut in the rock. This house, which is three storeys high, has four rooms, two in each upper storey, seven windows, and one door. The inside is covered with row upon row of equilateral triangular holes, the side of each triangle being about 6 inches, and the depth the same. Roughly speaking, there must be nearly 600 on each floor.[1] As nearly as I could judge, the house measured about 24 feet in length, 36 in height, and 27 in depth.

On March 13th I arrived at Amman, where is a flourishing Circassian colony. It was here that my troubles began. Just after luncheon two

[1] *See* "Survey of Eastern Palestine," vol. i, p. 94.

Circassian soldiers came and demanded my teskeries (passports for the interior), which, as neither of them could read, were not much use. However, they went away apparently satisfied; but about half an hour later two military officers, both Circassians, appeared on the scene. The elder was the rudest Oriental I have ever met; he clattered about with his sword, cursed the Bedawîn, smoked my narghileh, and drank my coffee. After a time he strode away with his subaltern, a most gorgeously dressed young gentleman, who presently returned and remarked that it was raining, and that it would most probably continue to rain. He went on to say that rain induced fever and made the roads very bad, so that I had better stay at Amman for some days, and not leave my tent while I was there.

Wishing to leave my tent after he had gone, I knocked up against an evil-looking sentry standing at the door, who pointed inside, saying, "Hone! hone!" meaning "Here! here!" I called my dragoman, who said that my papers were not satisfactory, and that I must wait until a soldier had gone to es-Salt (a day's journey) to telegraph to the Vali of Damascus for a fresh permission. The following day I spent in my tent, and in the afternoon sent Sheikh Fellah back to Jerusalem with a letter to the British Consul. Mustapha Aghah, the senior officer, told me I might go on to Jerash if I took with me the sentry, who affirmed that he knew the way.

On the following morning I started for Jerash, accompanied by a couple of soldiers. Before leaving I told the Sheikh of the village that I should like to see Mustapha Aghah, to ask him who was in charge of the police at Jerash. I was told that Mustapha had started early that morning for es-Salt, and had expressed his great regret at not being able to say good-bye. But as I rode out of the village I saw Mustapha Aghah sitting in his verandah! He jumped up, rushed out, and asked how it was that I had not already started, as the Sheikh had told him that I had left very early in the morning. This fact remains a mystery never yet explained. As I had read in Mr. Haskett Smith's Handbook that there were some interesting caves at Jazuz, I prevailed on my sentry to take me there, the other soldier remaining with the baggage. After seeing the caves, an interesting Roman burial-ground, we had luncheon, and then the sentry suddenly declared he had lost the way. The dragoman swore, the soldier blasphemed, my native servant was on the point of tears. After three hours' aimless wandering, we came across an Arab woman ploughing: she did not know the way, however. Luckily, we next met a stalwart gentleman with a club, who pointed out the way, but was ignorant of time or space, and said it was a long way off, and we should get there some time after sundown. Eventually, after a fatiguing ride of 12 hours, we arrived at Jerash, another Circassian colony, the sentry and the dragoman making the night hideous with their cries and oaths.

I immediately went to the Sheikh (Hamid Bey), who was most hospitable. I had met him five years before when at Jerash, and he

remembered me. Hamid gave me a dinner, as the mules had not yet appeared. Presently it began pouring with rain, and it was not until 9.30 that we heard the mules' bells. My dragoman darted out; I followed him; half the village woke up; every dog in the place, some 500 or 600, began barking, baying, and howling; every man shrieked and cursed at the top of his voice. Never did I hear so hideous a row. At last a lantern was brought, and then was revealed the sad spectacle of two lame mules, a smashed canteen-box, and five miserable muleteers shivering and yelling in the rain, like men possessed. In time their story was told:—"That son of a pig, the soldier, had lost his way; the god of the mules was wicked, for two mules had fallen down and broken their boxes." At this juncture my Mohammedan cook commenced saying his prayers, and, constantly repeating "Alhamdo illah!" called on God to witness that he at least was thankful for having arrived. Hamid Bey kindly asked me to sleep in his house that night, and about 11 o'clock, with singing ears, I crept into bed, but . . . . . .

The next three days I was allowed to remain in peace, and enjoyed myself in spite of the rain. I spent the time in going over the ruins, and took some photographs, and copied a number of inscriptions. But on March 18th, just as I was commencing a fresh inscription, I was promptly stopped, sent back to camp, and told to remain there, as military police had come from es-Salt to arrest me. I remained under guard in my camp all that day. Hamid Bey again proved himself very useful and obliging. He said he had known me for six years, which was true, and that I was doing no harm. He dined with me that evening. The next day the rain became absolutely torrential, and, availing myself of the kind offer, I slept in Hamid's house; but such is Oriental hospitality, that everyone is entitled to a free bed and a free meal in the Sheikh's guest-house. That evening a dinner and bed were provided for a military orderly, a native Christian, my dragoman, my English servant, two police officials, and myself. Of course, the meal was much richer than the simple Bedawîn fare. It consisted of rice, mutton, olives, several native condiments in saucers, sour milk, and a large flap of brown bread for each person, which was also used as a plate. As I was present, each person was provided with a spoon! When we had finished dinner and drunk the sour milk, it provided a meal for at least 20 men waiting outside. Next day Sheikh Fellah arrived with the permissions. This hardy old man, who is 83 years of age, had ridden about 150 miles in the pouring rain in four days. Of course, he was cold and drenched to the skin. Fearing he might catch fever, I gave him a glass of boiling water and two ginger tabloids. The effect was marvellous. At first he thought it might be a forbidden liquor, but I showed him that it was a medicine. He liked them so much that he took 10 away with him. These tabloids seem to have an extraordinary effect upon the natives. If ever any of them showed signs of cold or cholic, ginger invariably put them straight and made them cheerful, as two or three glasses of wine would an Englishman.

As I had now done all I could at Jerash, I started the next morning for ed-Der'aah. By great luck I met the Haj pilgrimage on its way to Mecca. It was, indeed, an extraordinary sight, and came on me suddenly. Miles it seemed to be of tents of every shape and form: military bell-tents; black Bedawîn tents; enormous square tabernacles of green, red, and white cloth; tiny *tentes d'abris*, some only being cotton sheets on poles 3 feet high. The gathering of people would be almost impossible to describe. In one place I saw a family of wealthy Turks in frock coats, all talking French; close by, a green-turbaned derwish reading the Korân; a little further on, the Pasha of the Haj, in a fur-trimmed overcoat, giving orders to a dapper young Turkish subaltern; here, two men who owned a most gorgeous palanquin, which they were in hopes of letting to some rich lady from Cairo, were fighting over the fodder of the two splendid camels that carried it; there, Arab stallions were squealing and kicking at the mules of the mounted infantry contingent. Indeed, an account of the variety and strangeness of the whole concourse would fill a volume. Not the least extraordinary part of the show was the sight of a great part of the pilgrimage encamped in a graveyard, tombstones being used for picketing horses, whilst here and there a skull or bone stuck out of the ground.

There were at least 10,000 civilians in the pilgrimage. Among them were many whole families of hajis, children and women being almost in as great numbers as men. The whole was under an escort of 500 mounted infantry, and a mountain battery. At five the next morning the gun was fired, and an hour and a half later the rearguard were mounting their mules, and the second gun was fired to signal that all had started. The enormous procession, at least four miles long, glittering with red, green, and gold saddles and ornaments, was an impressive sight that I shall never forget; for every animal had at least four bells on its saddle or neck. I could hear it like the sound of the sea, quite half an hour after the last of the procession had started. It is extraordinary that a mass of people such as I have described, who have had hitherto no notion of discipline or obedience, who are drawn from every class in the Turkish Empire, should be able to take down their tents and be packed and *gone* in an hour and a half. Subsequently I saw and had experience of Mr. Whiteley's transport at the manœuvres on Salisbury Plain, and I think that the next time the authorities wish to repeat the experiment that the Pasha of the Haj should be applied to for a few hints on civilian transport. Mr. Haskett Smith's Revised Handbook repeats Mr. Porter's statement made in 1858, that the "Haj is decreasing in numbers and importance every year." If it is now four miles long, what was it like in 1858?

Bosrah was the next place I camped at. There are now a battalion of infantry and a regiment of cavalry quartered there; the latter has a number of the most beautiful grey stallions I ever saw. The Commander of the garrison, accompanied by the Mudir of the village and the latter's son, called upon me, and wishing to be civil I offered cigarettes to all

three. But in doing this I made a mistake, for among the Druses it is not etiquette to offer a son tobacco in his father's presence without first asking the latter's permission. On this occasion the Mudir's son declined, but his father at once gave him permission, so that we were all happy together. A curious incident occurred while I was talking to the officer, who spoke a little French. A Druse came forward, salaamed, pulled out a little packet, and said "Antika." I opened the packet and found three small cartridges, which I recognised as belonging to a little rook rifle which I brought with me the last time I was there. I had given the man those cartridges five years before. This seems incredible, but it is a fact.

As I suspected that an attempt might be made to stop my going to the east of the Jebel ed-Druse, I roused the escort at three next morning, greatly to their annoyance, and rode away to Sweda to see if I could get my permanent escort for that journey. I ordered my dragoman to start the baggage at 9 o'clock, the baggage going to Salchad. The Turkish officer and Mudir both arrived at 8 o'clock with some papers, to stop my departure, and showed great annoyance at finding me gone. When I arrived at Sweda, about five hours' journey from Bosrah, I was received with great state, the guard being turned out with "Salaam dur," which signifies "present arms." I was ushered into the presence of Djevad Pasha, an exceedingly nice man, but as he could only speak Turkish, and I had only brought the Arab servant with me, I had to speak French to the servant, who had to speak Arabic to an interpreter, who in turn had to translate the Arabic into Turkish. After I had had some coffee, and received from Djevad Pasha a very acceptable present in the shape of 50 cigarettes and his photograph, I started off with a Kurdish officer and three soldiers. The officer, whose name was Ahmed Aghah, was an excellent man, as I had afterwards good reason to know. On the way to Salchad we came across a good many traces of the late insurrection. In one place we passed there was a quantity of bones, buttons, rags, &c., and I was told by Ahmed that about 1,000 Turks were entrapped in this place, and only 200 escaped. He also showed me the bones of a colonel, with a tattered epaulette sticking out of the ribs; the skull had been knocked to pieces by a bullet. We arrived at Salchad after a ride of 14 hours. I called on the Mudir that evening, and was surprised to see a little boy of about 10 years of age sitting in the place of honour. It seems he is the son of a great Sheikh who was taken prisoner by the Turks and made to serve as a private soldier in Damascus. He died of grief shortly after his release.

Concerning the castle of Salchad, which for so many years defied first the freebooting Templar and then the plundering Bedawîn, I will only say that nothing could give a better idea of a Saracen castle. Mr. Missionary Porter (as Sir Richard Burton calls him) proposed that Salchad should be restored as a fortress for a Turkish garrison, which shows that he most probably never saw the place, as once inside the wall it is now simply a heap of treacherous rocks. I have seen tons of masonry suddenly slip

and fall ; an avalanche would be easier to restore than the interior of Salchad Castle. Mr. Haskett Smith, in his edition of Murray's Handbook, gives a vivid account of an engine for raising great weights which he says has been discovered at Salchad. I asked every man in the place from the Mudir and schoolmaster down to the Zaptiehs (police) quartered there, and the little children. Not one had even heard of such a thing. It would seem that the thing which is not has been said, although I did see in use at Damascus a machine similar to the one described. It may be that some enterprising Druse has seen the machine at Damascus, and palmed off the story on the Editor of the Handbook, or it may have been that three Sheikhs, a schoolmaster, 10 children (who practically live among the ruins), three soldiers, and several other inhabitants banded together to tell me an unnecessary lie. I leave it to others to judge.

After three days' stay at Salchad I left for the east of the Jebel. On the road there were many traces of the late fighting, and that evening I had good reason to know that all was not as calm as it seemed. On my arrival at Saleh I met with a reception very different from what I was accustomed to. The villagers crowded up angrily, and tried to drive away the mules, but Ahmed Aghah drove them off with his whip—a bold thing to do for Druses, who are quite as independent, and nearly as handy with their weapons as Texas cowboys. Meanwhile, I noticed that one of my escort had retired to the kitchen tent, and, having muffled up his face, stood facing the wall of the tent. Presently the Druses sent a messenger to say that one of my escort was a native of the village, who had decoyed away and murdered the Sheikh during the fighting, and that they wished to kill him. The officer said they might kill him if they could, and seemed absolutely indifferent, sitting on the wall smoking a cigarette with an enormous Colt in his hand. Assim, the murderer, took the hint, jumped on his horse and rode away as hard as he could. No sooner did the people see him than their Martinis began to speak. But he got 700 yards start, and made good his escape, having had about as narrow a shave as a man could have. The cowardly nature of my muleteers soon appeared, as at the first shot they burst into tears and crept away to hide. When it was clear that Assim had got away dead silence fell over the village, and we had a most unpleasant twenty minutes, not having the least idea of what was going to happen. However, when Ahmed Aghah had finished his cigarette, he took off his sword and revolver and strode down to the village alone, leaving the two soldiers with me. Another unpleasant interval ensued, for it must be remembered that Ahmed Aghah had been in charge of some irregulars who had raided this village about six months before. However, at the end of twenty minutes he returned with the Sheikh, who passed off what had happened with a remark to the effect that "boys will be boys." I took coffee with the Sheikh and Ahmed Aghah, sleeping in his house. So what might have been a very unpleasant affair turned out all right.

At the village I passed the following day I was told no European had

been there for 40 years. All the Druses I met after Saleh were excessively obliging, going so far in one place as to pull down the walls of a house to show me an inscription, and always refusing bakshesh. When I arrived at Umm Rawak it was intensely cold, and snowing a little; there were enormous drifts in every direction, showing that it must have been a hard winter. While I was at Umm Rawak a good many people came for medicine, among them a couple of lepers.

I now come to the most interesting part of my trip. When I arrived at Radeimeh the Sheikh was particularly hospitable, not only giving me dinner, but feeding all my muleteers and servants. The sight of McKeon sitting between two Druse Sheikhs and being solemnly crammed by them with rice and bread dipped in oil and pieces of mutton was, to say the least, quaint. After the meal, which we had eaten in the courtyard by moonlight, we retired to the guest house where the village bard sang to the people a letter in verse from a former Sheikh who was a prisoner at Smyrna. It was a pathetic sight to see all those sad and solemn faces gathered round listening to the wailing chant of the young poet. He played on the usual Bedawîn violin with its horsehair bow and strings. When he played his voice gave out a sound exactly similar to that of the violin, and at the end of a long drawn note it was impossible to tell which was making the sound, so perfectly did he strike the note. Yet strange to say the same man could neither whistle nor hum a simple English tune which I tried to teach him the next day. After the singing was over the Sheikh took my dragoman aside and told him that there was a certain place in the desert, named Heberieh, where there were many arms, legs, and fingers sticking in the stones. It was a strange place, but no other European had ever been to it. It was a long ride and would require an escort of at least 15 men, although they were now at peace with the Bedawîn. I decided to visit the place the next day, visions of some ancient quarry or isolated sculpture rising before me, and as there was no mention of anything of the sort in Murray's Handbook, I had great hopes of making a discovery.

I started at four the next morning with an escort of 15 men, including my host of the night before and his two sons, for Heberieh. The first two hours of the journey were spent in going over rough sand and through scrub, but suddenly huge black walls of lava appeared before us, and we entered on the most extraordinary country I have ever seen in the course of somewhat extensive travels in four continents. The only comparison which suggests itself to me is a fireless hell; nothing else could look so horrible as that place. Enormous blocks of black shining stones were lying in every direction; in places we passed great ridges some 20 feet high and split down the centre. One of these stretched over a mile and looked like a gigantic railway cutting. There was neither a living thing in sight, nor the least scrub to relieve the eye from the monotony o the slippery black rocks. My dragoman said to me, "What sort of country this? Whyfor are they all the same colour from the slave? Beforetime I never see one place like this. I tink one

devil he live here." It was really appalling. My horse, surefooted animal as he was, came down twice, and I believe several of the escort had the same luck; indeed, it is a mystery to me how the horses got along at all. Eventually after four hours' ride through this *inferno* we reached an open space in the centre of which was a hill, and the Druses cried out that we had arrived at our destination. At first I thought the hill was only a mass of lava and sand, but on closer examination I found that it was a huge mass of bones and lava caked with bones. It was infested with snakes; I myself saw four gliding through the bones. When I had taken some photographs and secured some specimens of the rock and bones we started on our return at once, the latter part of the journey being enlivened by one of the Sheikh's sons trying to shoot a soldier of my escort because his horse had kicked him. The old Sheikh dodged in to keep them apart and rode between them all the way home. When we got back to camp the 16 horses that started had three shoes left between them, which gives some idea of the badness of the road. The old Sheikh refused to receive any money for the trouble he had taken, but asked me to bring him a pair of field glasses on my next visit. I can say on excellent authority that I am the first European who has visited this place.

The following day I made an easy stage to Shaabah, where I took photographs of some Druses sitting in the theatre. After four more days, riding through various villages a description of which would not interest the reader, I arrived at the Turkish barracks of Musmieh. The colonel and half the regiment were absent, being the escort of the Haj pilgrimage. I called on the adjutant and was received with great hospitality. A fatigue party was told off to pitch my tents, and when they had been pitched five sentries were posted round them. These sentries stood at attention the whole time like statues, never moving a muscle; they were relieved every two hours. I saw the evening parade. The men were well armed and drilled and had good boots, but the rest of their uniform was in rags. They had three belts, one round the waist and one over each shoulder filled with cartridges, and these belts are never removed. They seemed very good-tempered fellows, and when some gypsies appeared with musical instruments the garrison turned out and joining hands with the "down-trodden" peasantry (this is a Christian village) proceeded to dance for three-quarters of an hour. About 7 o'clock some 20 women and children came to the barracks with buckets which were filled with rice, which is voluntarily kept back from the men's rations for the poor. I am told this is a common custom, and I may add that everywhere Druses, Bedawîn, Circassians, Fellahîn, Christians, alike praised the Sultan as the best and most charitable of men. Some of the Druses added that when they revolted they did not know how good a governor they were attacking, and that now they blessed the Sultan every hour of the day.

This practically brought my travels to an end, for two days later I reached Damascus, now troubled by a railway and other European

abominations, and thence, as quickly as railways and boats could take me, back to London, determined to revisit my Bedawy, Druse, and Circassian friends at the earliest opportunity.

NOTE ON BONES BROUGHT FROM EASTERN HAURAN, SYRIA, BY MR. MARK SYKES.

By E. T. Newton, Esq., F.R.S.

Among the bones submitted to me from east of Hauran, near Damascus, are several "horn-cores" belonging to a form of goat with spiral horns, and the limb bones accompanying these very probably belonged to the same species, which, it would seem, was of larger size than the common European goat, and may be a Syrian domestic animal.

Many of the bones have evidently been subjected to great heat, and some masses of them are surrounded by a vesicular slaggy substance, but there is not sufficient evidence to show whether the heat and the vesicular material are the result of artificial burning or volcanic action.

It may be that the mound from which these bones were derived was of human origin, perhaps a kitchen midden or the refuse from long-continued sacrifices. In either of these cases the burning would be accounted for. But it is quite possible that the accumulation of bones has been encroached upon by the lava, which is said to be close at hand; and, if so, the vesicular matter and the burning may be both entirely due to this natural cause.

It would be interesting to know if bones of any other animal, or perhaps of man, occur in this mound; search might be made with this intent, and also to find, if possible, any human handiwork, such as flint implements or, perhaps, pottery or metal ornaments.

It would likewise be of interest to know whether the deposit of bones extends for any distance under the volcanic rocks which are said to occur around the spot.

It seems probable from the nature of the bones that the accumulation is of comparatively recent origin; but possibly it may be prehistoric. If, therefore, it could be shown that the volcanic lava was subsequent to the deposition of the bones it would indicate a very recent date for the volcanic eruption.

THE DRAGON WELL.

By Ph. Baldensperger, Esq.

Dr. C. Schick's paper on "The Dragon Well," in the October, 1898, number of the *Quarterly Statement*, speaks of the great numbers of "black and long worms" in the Birket es Sultan. In fact, the gigantic millipede—*Julus gilognatha*—abounds about the rocks of the lower pool of Gihon; and the particularity of these *Julidæ* consists in rolling themselves up as soon as touched. The smaller species, "*Glomeris*," rolls into a ball, while this one simply forms a spiral, with the head innermost. On account of this striking feature it is called "Moses' Rod," عصاة موسى, 'Assaat Mûsa, by the Palestine natives, in memory of the miracle performed at the Court of Pharaoh—as it suddenly unfurls and continues to creep, as did the serpent transformed before the Egyptian king. Moses' rod and serpent are, or may have been, identical among the Israelites of old, and perhaps the name "Moses' Rod" was given by them to the millipede, and also to the well, for the same reason.

About 600 yards from the Birket es Sultân, lower down on the right side of the En-Rogel road, is a small cistern, to which we boys, thirty years ago, gave the name of Serpents' Well—simply because serpents lived in it. More than once did I bring out a Hanish, حنيش, which is a black coluber, the longest serpent in Palestine, attaining often three metres or more—supposed by the majority of people to be dangerous, although it is as harmless as any coluber. But the black shiny colour, its swift movements, and its powerful respiration, have given birth to numerous stories often of the most absurd kind—as its cutting a man in two by its folds, and the like. Moloch, these hanish, and the millipede, mixed with fables, may have contributed to the name of the Serpents' Well.

NOTE ON THE "DRAGON WELL."

By the Rev. John Thomas, B.A., Head Master of the Royal Grammar School, Colchester.

In the *Quarterly Statement* for October, in an exceedingly interesting article identifying the "Dragon Well" with the Birket es Sultân, Dr. Schick writes very doubtfully as to the origin of that name, proposing, or rather mentioning, various origins for so singular a title. Is it not, after all, a mistake? It is true Josephus mentions ("Wars of the Jews," Book V, chapter 3) a Serpent's Pool, but this was at a time when

possibly, the error was already stereotyped by that conservatism which, later on, produced the Masoretic text.

At the Captivity the semi-voluntary migration of a part of the people to Egypt had given rise to another centre of tradition which finds occasionally its expression in the variations of the version of the Seventy.

Now the LXX know nothing of a dragon, or serpent, well. They simply have "the Gate of *Figs*." A much more likely name.

It is not very difficult to see how the divergence took place. The Masoretic text has (Neh. ii, 13) הַתַּנִּין, while the reading of the LXX συκῶν would have as its Masoretic equivalent תְּאֵנִים.

Does it not seem as if the name had been forgotten as to meaning (and possibly as to pronunciation), and restored by Nehemiah from some MS. which did not retain the א which the received spelling of that later time had dropped.

NOTES ON ANTIQUITIES OF THE PENTATEUCH.

By Lieut.-Colonel C. R. Conder, R.E.

Cush.—It has been very generally supposed that the Asiatic Cush (Gen. x) was connected with the Cassites of Babylon. The latter have been supposed by many antiquaries to have been of the Akkadian or Mongol race, a conclusion which seems to be supported by the Semitic translation of their kings' names, though Dr. Hommel has endeavoured to prove that they were Arabs. Nimrod, the hero of this race, lived in the cities of Erech and Calno, where it is known that a Mongol population existed. Early Assyriologists suppose him to be represented by the Babylonian hero called Izdubar (otherwise read Gilgames), whose story was apparently of Akkadian origin. This name is written with the three signs, *IZ-DHU-BAR*, the meaning of which in Akkadian, if taken ideographically, is "man become illustrious." The sign *DHU*[1] (otherwise *AL*) is an Akkadian prefix forming the passive of verbs. The Semitic translations of *BAR* include *Amaru* "to see," hence with the passive form this name might be *Nammurutu* "glorious." The writer in Genesis may have found it written in syllables, and so rendered it Nimrod, or "hero."

Midian, Ishmael, and *Moab.*—The term Midianite seems to be generally applied to the inhabitants of the Eastern plateaux from Gilead to the Gulf of 'Akabah, and appears to be a geographical term—possibly connected with *Medina*, "town." One tribe of Midian (Gen. xxv, 2) was

[1] For this sign *DHU*, *see* Dr. Sayce's Syllabary No. 495, with the Akkadian sounds *dhu*, *dhun*, and *al*.

Semitic, and the Midianites lived in Moab (xxxvi, 35; Num. xxii, 4, 7; xxv, 2, 6) and east of Sinai (Exod. iii, 1). There appears, therefore, no reason why Ishmaelites and Midianites should not be noticed together (Gen. xxvii, 25, 28), though difficulties have been made on this point by critics. Ishmaelites lived in the same region (Gen. xxv, 13), among the Edomites and Midianites. In one passage, indeed (Judges viii, 24), the Midianites are said to have been Ishmaelites.

The Asshurim.—In Gen. xxv. 3, the name אשורם occurs among those of Keturah's sons, who, according to Lenormant, lived in North Arabia. They included also Midian. The word does not appear to be a plural. In verse 18, אשורה is mentioned, clearly (with case ending) referring to Assyria. These words have been confused by recent writers, and there is no notice of any "Asshurim" in the south of Palestine.

The Hyksos.—There is no mention of any interpreter between Joseph and Pharaoh, or Jacob and Pharaoh, but the native Egyptians are noticed as hating Hebrews and shepherds. If, as is usually supposed, the Asiatic Hyksos kings were ruling in Egypt at this time both these indications are easily understood. The name of *Ra*, which occurs in that of Potipherah, priest of On (Gen. xli, 50), does not contradict this view, since it is commonly found in Egypt in the Hyksos age. The establishment of a Hebrew vizier among a people who hated Hebrews is best explained by the presence of a foreign Asiatic dynasty. Many explanations of the mysterious word *Abrak* (Gen. xli, 43), from Egyptian and Assyrian, have been proposed, but the root found in Hebrew (אבר) seems sufficient to show that the rendering is correctly "and they called him in his presence 'Your Highness.'"

Goren Atad.—It is very difficult to understand how Jacob's funeral procession could have proceeded from Egypt "beyond Jordan" (Gen. l, 11). The natural route to Hebron would have been by Beersheba. It is notable that on the hills north of Beersheba, west of the main road to Hebron, there is a ruin called *Abu Jerwân*, "father of threshing floors." This might preserve the name of the *Goren* in question, in which case the "meadow of the Egyptians" would be the plain east of this road, immediately north of Beersheba.

The Mixed Multitude.—It has been suggested that these were not Hebrews. In one case (ערב רב, Exodus xii, 38) they are contrasted with full-grown men. In the other (האספסף, Num. xi, 4) the word means "crowd." The former term seems also to mean a "mob." There is no apparent reason to regard these terms as applying to strangers.

The Spies.—It is difficult to understand how the spies could go to Rehob near Hamath from Zin, and return to Paran near Kadesh in forty days (Num. xiii, 21–26). Rehob is here mentioned before Hebron, and no other city in Palestine is named. In another passage Eshcol near Hebron seems to be the limit of their journey (*see* the word עד, "as far as," Num. xxxii, 9), if so, Rehob may be the same as Rehoboth in the plains south of Beersheba. It then comes in its proper place in the narrative, and the words "as men come to Hamath" are either the

insertion of a later scribe, or to be rendered "at the entrance of the guarded place."

The Amorites.—On approaching the plateau north of Edom the Hebrews found that the Moabites had been driven south of Arnon by Amorites. The Tell Amarna letters show us that, about the time of the Hebrew invasion, Amorites from the far north of Syria, aided by Hittites and Cassites, had invaded Bashan. This casts a remarkable light on the history of Balaam. He came from Pethor in Aram (Syria), and his fame may have been brought as far south as Moab by the Amorites, who had lived not far from his home, at Tennib, east of the northern Lebanon.

The Cuneiform texts thought by some scholars to refer to Amorites at Sepharvaim in Mesopotamia, about 2000 B.C., would be highly interesting, but for the fact that the word is so often to be read quite as probably *Akharri*, or "western," so that the lands "west" of the city may only be intended. The Amorites, as an Aramean people, no doubt may have come from this region at an early period, but the term appears to be geographical, not racial at all.

The Assyrians.—The mention of Assyria in the prophecy of Balaam (Num. xxiv, 22, 24) has been thought to refer to the later times of Tiglath-Pileser III (732 B.C.), though the other allusions are only explicable as referring to David's conquests. Balaam speaks of the Kenites who were allies of the Hebrews established in the region south of Hebron after the Hebrew conquest. The words properly rendered may be thus given in the rhythm of Balaam's "parable," or "ballad":—

"O strong is thy abode, in a crag is set thy nest.
Shall Kain be wasted then, and when shall Assur capture thee?
Ah! who shall live if God do so. But ships from Chittim's shore
Shall vex Assûr, vex him who comes, and he shall perish too."

This reference to Assyrian raids may be of any date, from the fifteenth century B.C. downwards. According to the Phœnician letters of Tell Amarna aid against the Amorites and their Cassite allies from beyond the Euphrates was sought in the fleets of Tarsus and *Misi* (possibly the Mash of the Bible), and the east shores of the Mediterranean were visited by navies from Asia Minor, and probably also from Cyprus (Chittim), before the time of Joshua's conquest of Palestine. The expectation that Assyrian incursions would be stopped by such fleets was therefore very natural even in Balaam's time, and if he came from Pethor, on the Euphrates, he would naturally be acquainted with the actual conditions of the struggles of Syria in his own age. The great Assyrian king, Assur Uballid, late in the same century, marched into Syria (as far south as Beirût apparently); and in the twelfth century B.C. Assur-risisi was at Beirût, and was followed by his son, Tiglath-Pileser I, who sailed on the Mediterranean in a ship of Arvad. Rameses III also used ships to attack Cyprus about 1200 B.C., and by the time of David the Assyrians had even reached Egypt—possibly by sea. On the other hand, we have no account of attacks by fleets on the later Assyrian invaders of

Palestine. The allusion in Balaam's prophecy seems, therefore, to point to early times.

Sinai, *Sin*, and *Zin*.—These words have no very good explanation in Hebrew, and Sinai is otherwise called Horeb, or "desert." Possibly the term represented is Mongolic, and to be compared with the Akkadian word *Zin*, "desert."

Egyptian Names.—It is not unnatural to suppose that some of the names in the Pentateuch are Egyptian, especially as Hagar and Asenath —the wife of Joseph—were Egyptians. The name Mesha or Moses is very clearly the Egyptian *Mes-a*, "Child of water," and the names Putiel and Phinehas have been supposed Egyptian. To these in all probability Aaron and Miriam should be added, the latter meaning "beloved," and having no good Hebrew derivation. There are well-known Egyptian words in the story of Joseph, and the term *ab*, rendered "father" (Gen. xlv, 8), is Egyptian, Joseph saying that he has become "minister to Pharaoh." In the same way several Egyptian terms are used in the Canaanite letters of Tell Amarna.

Avims (Deut. ii, 23, Josh. xiii, 3).—These tribes lived east of Gaza in *Hazerim*, or "enclosures," and were conquered by the Egyptians of Caphtor. The name, perhaps, survives at *Beit 'Awa*, in the valley east of Lachish. In the story of Saneha (who fled to Edom in the time of the 12th Egyptian Dynasty) we find that he went from Edom to a country *Aia*, which was apparently in the south of Palestine. It was a land of fruit trees and corn, where the Egyptian language was known; and its inhabitants were much afraid of an Egyptian attack. This is perhaps a monumental notice of the Avims about 2300 B.C.

Idolatry.—The idolatry of the Canaanites, specially condemned in Deuteronomy, is constantly illustrated by monumental discoveries. We know that they had images of stone, bronze, silver, and gold, of pottery, and probably of wood. The *Asherah*, or sacred tree, is known monumentally among Amorites. They had images of a goddess with a child in her arms. Their priests were shaven. They used incense, and probably holy water. The latter at least used to be bought by the Babylonians from the temples; and they wore various objects blessed by their priests. The lesser deities among them were regarded as intercessors with the supreme God. Holy water was also used for sprinkling by the pagan Romans, in the time of Tertullian, who also mentions at some length the adoration of wooden crosses among the pagans of his age, in Asia. Some of these curious cruciform idols have been found in Phœnicia, and the cross is among the charms hung round the necks of Assyrian kings. The Hebrews were forbidden to "bow before" or "to be enslaved by" such idols, and the only carved representations of living things connected with religion were the cherubim hidden in the darkness of the inmost Temple, and seen only by the high-priest.

Gad and *Reuben*.—It is remarkable that the tribe of Gad (Num. xxxii, 34, xxxiii, 45) is mentioned as building cities which are elsewhere noticed (Josh. xiii, 16) as in the lot of Reuben. But on the Moabite stone the

"men of Gad" are mentioned as living in the same district—the plateau east of the valley occupied by Reuben. The Reubenites were probably "few in number," while Gad was a strong tribe.

Geshur.—The name of this region near Hermon—now *Jeidur*—has been rendered "bridge," which has no particular meaning. We should perhaps compare the Assyrian *gisru*, "strong."

Shenir was the Amorite name of Hermon (Deut. iii, 9). The Amorites, we now know, were an Aramean people, speaking a language like Assyrian. In Assyrian records Hermon is called *Saniru*.

The Utmost Sea.—It has been proposed to regard this (in Deut. xxxiv, 2) as being the Dead Sea, though the word (הים האחרון) means, properly, "the Western Sea." It appears hardly possible that this term can apply to the Dead Sea in another passage of the same book (Deut. xi, 24), especially as in Deuteronomy the "Salt Sea" is mentioned (Deut. iii, 17), evidently being the Dead Sea.

The Escaped Slave.—The law forbids (Deut. xxiii, 15, 16) giving up an escaped slave to his master. It is interesting to contrast the clause in the treaty of Rameses II with the Hittites, which provides for extradition of such fugitives.

Captivity.—It is not necessary to suppose that the references in the law to a people of strange speech, and to foreign captivity (Deut. xxviii, 49, 68, xxix, 22, 28) refer to Assyrian or Babylonian captivity. The earlier Assyrian raids have been already noticed. Thothmes III, long before the Hebrew conquest, took prisoners and hostages from Palestine. The Cassites in the fifteenth century B.C.,[1] and the Aryans from Asia Minor in the fourteenth, spoke languages which would be unknown to the Hebrews, and invaded Palestine. The Assyrian was a language known to the Hebrews in the eighth century B.C. (2 Kings xviii, 26), and it was only when the Scythians invaded Judah, in the seventh century B.C., that a non-Semitic language was again heard in Palestine. The danger of being carried captive to Egypt "in ships" was great in the time of Moses, but it had ceased to be probable in the time of David and afterwards.

NOTES ON THE "QUARTERLY STATEMENT," OCTOBER, 1898.

By Professor CLERMONT-GANNEAU, LL.D.

P. 246. *The Inscription of the Crusades and the Arabic Inscription from Jaffa.*—The marble flagstone in question, which is now in Baron Ustinow's collection, was discovered by me in 1874 in the sanctuary of Sheykh Murâd. The Latin epitaph and the bishop's portrait on the one side and the

[1] *See*, for instance, the letter of the Cassite king, Ammi Satana, written in Akkadian ("Records of the Past," New Series, V, p. 103).

Arabic inscription on the other have been printed and commented upon at length in my "Matériaux inédits pour servir à l'Histoire des Croisades" (1875, pp. 29–41), and again in my "Archæological Researches in Palestine" (vol. ii, pp. 152–154). The date of the mediæval inscription is 1258, not 1198; that of the Arabic inscription written on the back is 736—the figure of the hundreds was still in a perfect state of preservation when I saw the original; further, the patronymic of the founder of the mosque, the Emir Jemâl ed-dîn, was still legible upon it.

P. 252. *Greek Inscriptions from Syria.*—I apologise to Dr. Murray for having fathered upon him an incorrect reading, for which, as he justly observes, Professor Porter is responsible. However, he will, I hope, allow me to remark that there was every indication that he himself unhesitatingly accepted this reading, by speaking of the "name of *Zeus Hypsistos* as that of the Deity to whom the altar is here dedicated," and insisted upon the importance of this pretended name which might have been "adopted by Jews as the equivalent of Jehovah." I am glad to see that he has come round to the reading *Megistos=Maximus* which I have proposed, and which makes his learned commentary upon *Hypsistos* superfluous. As for the interposition of Σωτῆρι between Διὶ and Μεγίστῳ, I am quite ready to bow to Dr. Murray's conjecture which tends to supplement my own, the more so as he has over me the very great advantage of having the original photograph before him, whereas I have nothing to go upon except the copy of it given in the *Statement*, which is, of course, inferior, nevertheless, after examination, and under reserve of this last observation I must say that I doubt the existence, at the end of line 1, of the two letters CW, on the basis of which Dr. Murray establishes his restoration CW[THPI]: with the best intention in the world, I can only distinguish the curvilinear elements of a M (Mu), identical in form with those of the rest of the inscription, and the initial of M[E]ΓICTW. I further think that there would not be room for the eight letters [Σωτῆρι με-] at the end of the line.

I believe that Dr. Murray agrees with me as to the reading Ἡλιοπολείτῃ in place of Ἡλιοπολειτῶν.

As for the mutilated inscription from Jerash, Dr. Murray cannot really be annoyed with me for having informed him of a fact which had escaped him, viz., that the complete copy of this text had been published a year before,[1] and for having remarked at the same time that his restoration was obviously divergent from the original text; in epigraphy it is always interesting to have the opportunity of seeing how far the inevitable part played by hypothesis diverges from or more closely approaches the reality; it is at the same time a controlling influence over the conjectural method to which we all constantly find ourselves obliged to have recourse with more or less success. My remark had no other object; I know by experience that we are all fallible in this respect, and I make no pretensions to being "wiser" than others, either before or "after the event."

[1] The date 1879 is a typographical error for 1897.

"THE UPPER WATERCOURSE OF GIHON."

By the Rev. Andrew J. Gregg.

Immediately behind the wooden hut on the Jaffa road, near to the Jerusalem side of the turn to St. John's ('Ain Kârim), where toll is taken from the fellaheen for country produce, is a telegraph pole supporting the wire to Jaffa. This pole is at the entrance of a small sunk stone enclosure, about 12 feet across, and surrounded partly with solid rocks. At the opposite side of the enclosure is a small excavation in the rock, about $2\frac{1}{2}$ feet wide and 4 feet in, and 3 feet high, the bottom being filled with clay and stones. The hill west of this is very fertile, covered with rich olives, and abounds in tesserae, and the occupants of the wooden hut say that this enclosure contains water. From this, which I think is a natural spring, I can distinctly trace cuttings through the rock on the west side of the road towards Jerusalem, as though for the construction of an aqueduct, as far as the low part of the road which forms the watershed between the Kedron Valley and the Valley of the Convent of the Cross. At this place a low embankment runs along the east side of the road, which looks like a substructure to supplement the elevation of the ground along the very summit of the watershed, and after carefully trying the level from the opposite side of the Kedron Valley, under Shneller's School, and noting the places in which to look further on behind the Turkish Hospital and the Sanatorium, I found in a quarry of very white stone the distinct marks of water wear about 3 feet from the surface of the rock and at the required level; the rock being covered with made rubbish of earth and stones, and where the exposed rock face ends, an interval of clay apparently filling in the continuation of the clue. Farther on still, at the back of the new Sanatorium, the rocks are cut away at the required level (the ground rising towards the Sanatorium) for a considerable distance in a straight line, and when the back of the old Sanatorium is reached the line takes a curve round to west (following the contour of the ground, which here falls a little before it rises again at the Turkish Mosque), and goes towards, and nearly to, the wall at the back of the central building of the new English hospital; a very old cistern being partly to be seen just where the traces of the channel end. This is, I think, within a stone's throw of the place where the last traces of the channel from the north-west corner of the present city were seen,[1] and I satisfied myself again with the level that there was a fall all the way from the watershed on the Jaffa road before venturing to give expression to the assertion that this is the long-sought-for "Upper Watercourse of Gihon." And though a "fountain of Gihon" is not particularised in Scripture among the "fountains without the city which Hezekiah stopped"; that the hollow and excavation behind the wooden hut on the Jaffa road is the fountain which yielded the supply.

[1] *Quarterly Statement*, 1891, p. 279.

THE ANCIENT ROAD FROM NEAR THE PRESENT BAB EZ ZAHARE.

By the Rev. Andrew J. Gregg.

In the present north wall of Jerusalem I have found its intersection by the road from the Haram es Sherif and from Antonia which crosses the hill over Jeremiah's grotto, passes by the tombs of the kings and near the heap of ashes, goes right straight on down the hill, crossing the present north road, passes near the tombs of the judges and near Mizpah, on to Antipatris and so to Cæsarea. This would be the road by which the ashes were brought from the temple to the fields of Kedron, and by which our Lord would, with greatest convenience to the garrison of Antonia, have been taken to execution, whether on the "green hill far away" or at the place of ashes, and St. Paul would have been brought by the same road on his night ride to Cæsarea. Old residents of prominence in Jerusalem, to whom I spoke of it and showed it, had not known of it before, and I do not see it alluded to in any book or map.[1]

Where the American house now stands, on the highest point of the rock over Solomon's quarries, the present wall takes a turn southwards, then eastwards, and again northwards, forming a sort of bay; from the east point of this bay there are 14 loopholes in the wall to the next tower, and Herod's Gate is at the next tower east of this. Count five loopholes from the corner and 10 from the tower, and immediately underneath is the bed of the road cut in the solid rock. I tore away the clay to make sure; the part of the road outside the wall being scarped down nearly flush with the present structure above.

THE VALLEY OF HINNOM.

By the Rev. W. F. Birch, M.A.

In defence of Wady er Rababeh the popular line for this valley and in opposition to the *true* line through the Tyropœon Valley, Prof. Wright (*Statement*, 1898, 261) asks me (1) "to point out Jebus in the list of the towns of Judah," while Jerusalem is confessedly included in Benjamin's list; and he refers (2) "to the north line of Judah in Josh. xv, and the south line of Benjamin in xviii being exactly the same, and both of them passing 'south' of Jebus."

In reply to (1) I ask Prof. Wright to point out Bethlehem in the said list. On his doing so, I will in turn gladly point out Jebus. Apart

[1] But *see* Smith's "Dictionary of the Bible," Art. "Jerusalem," by Sir Charles W. Wilson, R.E., pp. 1594 and 1656.—Ed.

from that list, however, I am satisfied that Bethlehem-Judah was in Judah.

As to (2), let it be conceded that the two Hebrew terms translated (R.V.) *southward* in Josh. xv, 8, xviii, 16, practically mean on the *south* side, so as to make the line pass south of Jebus. I would then point out that the north line of Benjamin is also in xviii, 13, said to pass "to Luz, to the side of Luz (the same is Bethel) southward."

Now if the southerly term used in verse 16 requires Jerusalem to be wholly north of the southern line, *i.e.*, in Benjamin, why should not precisely the same term in verse 13 require Bethel to be wholly north of the northern line, *i.e.*, in Ephraim?

Difference of latitude of places surely does not necessarily extort latitude of meaning. It is true that in 1 Chron. vii, 28, Bethel is named among the possessions of Ephraim, but in Josh. xviii, 22, only nine verses from home, Bethel is distinctly catalogued in the list of the towns of Benjamin. Thus it is clear that the mention of *south* does not help Dr. Wright's popular position for Hinnom. Further if it be argued that the mention of Jerusalem in Benjamin's list requires not only the more important or populous part of Jebus to have been in Benjamin, but also the whole of Jebus to have been in the said Benjamin, then at once I go up again to Bethel for a reply. I find that Josh. xvi, 2, states that the south line of Ephraim (here "exactly the same" as the north line of Benjamin) "went out from Bethel to Luz" (R.V.), yet Bethel and Luz are "the same" in xviii, 13, and elsewhere. It results, therefore, that Biblical usage permits Bethel to be now identical with Luz, now diverse from Luz, *i.e.*, it admits of a larger and a smaller Bethel.

The licence thus granted to Luz in the north may be fairly claimed for Jebus in the south of Benjamin, and, as I showed in 1878, satisfactorily removes a topographical difficulty by allowing the Valley of Hinnom to divide Jerusalem, and to be drawn along the Tyropœon, a line as respectful to Jeremiah as it is necessary to Tophet. Hesbon seems similarly to have been divided between two tribes, as in Josh. xiii, 17, it is named among Reuben's cities, but is mentioned as given out of the tribe of Gad in xxi, 39, and 1 Chron. vi, 81.

As the castle of the Jebusites was situate on Ophel (so called), the southern part of the eastern hill, Jerusalem justly comes to be reckoned among Benjamin's cities in Josh. xviii; still a portion of Jerusalem was really west of the Tyropœon (probably) on the hill of the upper city (of Josephus), and so was actually within the tribe or lot of Judah. Accordingly Judah (Judges i, 3) after saying to Simeon: "Come up with me into *my lot*," lawfully, according to the Bethel licence of an elastic Jerusalem, attacked and took Jerusalem; but as they captured only the weaker part of Jebus, it was not specifically catalogued in their list in Josh. xv. A note was merely added (v. 63): "As for the Jebusites, the inhabitants of Jerusalem, the children of Judah could not drive them out: but the Jebusites dwell with the children of Judah at Jerusalem, unto this day."

I am obliged to Dr. Wright for advocating the popular Himnom error which (Bonar, 488) first appeared in the seventeenth century. His objections to my Tyropœon line have now (it seems to me) been amply proved to be groundless; and this is the only line that satisfies Judges i, 3; Josh. xv, 63; Jer. xxxi, 40; and vii, 32.

In conclusion I quote from Mr. Henderson's "Palestine," p. 123: "A most ingenious note will be found in Dr. Bonar's 'Land of Promise,' p. 486, proposing to find the Hebrew Ge-ben-hinnom in the Greek Tyropœon. He supposes that Josephus took the first two syllables of the name Ge-ben-hinnom for *Geben*, the Hebrew for *cheese*, and translated it by the Greek equivalent, and he points to an exactly similar mistake by the LXX in Ps. lxviii, 15, 16."

PISGAH.

By the Rev. W. F. Birch, M.A.

Dr. Post points out in *Statement*, 1888, 196, that "the most comprehensive, as well as the most detailed, view of the whole Promised Land" is to be obtained from Jebel Hosh'a. Apparently he would identify it with Pisgah or Nebo, if the name Neba did not occur near Siaghah. As any possible site for Dan must be invisible from Siaghah and its immediate neighbourhood, Neba deserves no consideration or favour as Pisgah so long as a view is required strictly conformable to the Biblical details in Deut. xxxiv. Neba may derive its existence from the city Nebo, and Ayûn Mûsa (the Springs of Moses) be no more genuine than the traditional Mount Zion.

While there are some attractive arguments for making Jebel Hosh'a to be the head of Pisgah, the objections to such an identification seem to me solid and unanswerable.

In favour of Jebel Hosh'a it might be urged that:—

1. It commands the finest panorama in Palestine, taking in even the extreme southern end of the Dead Sea, the plain of Jericho, and (I believe) Dan, in the Merj Ayun, together with Hermon. Perhaps this last item is a positive drawback.

2. As Shittim was in the plains of Moab, so possibly Jebel Hosh'a may have been in the *land* of Moab (*Statement*, 1898, 113), though I suspect it was in "half the land of the children of Ammon" given to Gad (Josh. xiii, 25).

3. Jebel Hosh'a is certainly *over against*, *i.e.*, in sight of Jericho (Deut. xxxiv, 1).

4. If Moses in his first survey from Jebel Hosh'a faced N.N.E., then the Dead Sea would have been to him "the behind sea."

5. It is said to Moses, in Num. xxvii, 12, "Get thee up into this Mount Abarim." From the use in Jer. xxii, 20, R.V., of the three terms, Lebanon, Bashan, and Abarim, it might seem that Abarim was applied not only to the mountains in Reuben, but also to those in Gad, south of Bashan.

To the above I could only reply that the N.N.E. prospect is hardly satisfactory, since there is no subsequent mention in detail of Gilead south of Jebel Hosh'a or of Reuben's territory, though both would be in view.

On the other hand, as against Jebel Hosh'a, it is easy to show that in the Bible the terms Abarim, Nebo, and Pisgah are connected with the block of mountains east of the Dead Sea.

a. Num. xxxiii, 44, states that "Israel pitched in Iye-Abarim in the border of Moab." This places Abarim near Moab. Again (47), they "pitched in the mountains of Abarim before Nebo," and (48) departing from the mountains of Abarim, "pitched in the plains of Moab by Jericho." This last march to Abarim, previous to the descent to Shittim, seems identical with that (xxi, 20) "to the valley that is in the field (*Sadeh*) of Moab, to the top of Pisgah which looketh down upon the desert (Jeshimon)." The *Sadeh* of Moab certainly did not extend to Jebel Hosh'a, even if the *land* of Moab did. Thus it is clear that Abarim, Nebo, and Pisgah are at home east of the Dead Sea.

b. Further, Pisgah is four times associated with this part through the mention of Ashdoth-pisgah (the slopes of Pisgah, R.V.). For—

1. The boundary between Gad on the north and Reuben on the south practically ran along Wady Hesban, and near Tell Râmeh (Beth-haran), in the Ghor Seisaban, four miles north of the present Dead Sea. As then the Jordan valley (Deut. iv, 49) reached southwards "unto the sea of the Arabah (*i.e.*, Dead Sea) under the slopes of Pisgah," it follows that "the slopes of Pisgah," and therefore "Pisgah" itself, had to do with the mountains adjacent to this sea.

2. Again, among Reuben's cities (Josh. xiii, 19) are named (apparently from south to north) Zareth-Shahar (Zara?) in the mount of the valley, and Beth-peor and Ashdoth-pisgah and Beth-jesimoth (Ain Suweineh). Here again Pisgah must be in the eastern mountains.

c. The march to "the top of Pisgah which looketh towards Jeshimon" brought Israel to the encampment "in the valley over against Beth-peor" (Deut. iii, 29; iv, 46), the precise description (xxxiv, 6) of the burial-place of Moses.

This mention draws together Pisgah and Beth-peor, so that as Pisgah looked toward Jeshimon, it is not strange that "the top of Peor" (to which Balaam came) is also said to look toward Jeshimon.

Any eminence projecting westwards among the mountains on the east of the Dead Sea might suitably be said to "look down upon" or "bend forward in sight of" the Jeshimon, whether this be the desert of Judah

on the west of the Sea, or the district near Beth-jesimoth on the east, whence from an elevation the Galilean Sea could be seen, if we credit the Talmud (*Statement*, 1897, 119).

It has thus been abundantly shown that the top of Pisgah overlooking Jeshimon was east of the Dead Sea; while there is not a rag of evidence to show that (*a* or) *the* top of Pisgah, in the land of Moab, over against Jericho (Deut. xxxii, 49; xxxiv, 1), was identical with Jebel Hosh'a. This "Jericho" detail seems to be a later addition by one viewing Pisgah from the western side.

d. The fact that Moses was buried near Beth-peor on the east of the Dead Sea seems fatally to exclude the notion that his last view and death occurred on Jebel Hosh'a, some 27 miles distant from the place of his burial.

If it can be proved that the view required by Deut. xxxiv is not to be gained from the mountains of Moab, but can be seen from Jebel Hosh'a, then apparently it must be admitted either (1) that the details in Deut. xxxiv are *incorrectly* added; or (2) that Jebel Hosh'a represents the Pisgah of Moses, and that his body was transferred nearly 30 miles, and that Hermon (Lebanon) was an object within view, indeed, but unaccountably omitted in the description. Colonel Conder writes: "I was on Jebel Osh'a in fairly clear weather after rain, but the view was disappointing in the far distance. The fact is, one cannot, in the best weather, see much 100 miles away in any country."

Moses might, indeed, have been favoured with exceptionally pellucid atmosphere on his last day, but the observer who furnished the final detail "unto Dan," had no advantage over a modern surveyor armed with a telescope. I trust, therefore, that judicious observation will make out the Merj Ayun from Talat el Benât, and so save me from the horns of the above dilemma.

BAALGAD.

In placing Baalgad (*Quarterly Statement*, 1898, 114) in *western* Palestine, I omitted to quote the passage proving this position, viz., Josh. xii, 7: "These kings . . . . Joshua smote on this side, Jordan *on the west* from Baal-gad in the valley of Lebanon, even unto the Mount Halak that goeth up to Seir." The northern slopes of Hermon near Ain Jideideh, mentioned by Colonel Conder (p. 120), are certainly not *on the west*, and therefore this site is impossible. To his adverse criticism on the desirable connection of Kady with Gad, I have, in ignorance of Arabic, nothing to say. Still the collection of dolmens, unique in this district, seems to point to a centre of ancient worship at this spot.

THE BOARDS OF THE TABERNACLE.

By Professor Theo. F. Wright, Ph.D.

In some very interesting remarks on the Tabernacle in the last *Quarte Statement* the venerable Dr. Schick said that the boards have "nothi similar in any regular Oriental tent," p. 244. May I be allowed o criticise this position, which is, of course, that of Tabernacle students in general? The boards formed three sides, as all agree, standing upright in their sockets, and so joined by the bars and at the corners that they formed firm walls. Now, Oriental tents in general, except those of the poorest and least comfortable sort, have something in the way of walls, and must have something for comfort and decency. Indeed, this want, which was supplied in the Tabernacle by the boards, is supplied in the ordinary tent by three devices :—

1. A wall of goat's-hair.—In his "Notes on the Bedouins," London, 1830, J. L. Burckhardt very fully describes the tent, and says : "The back part of the tent is closed by the *rowak*, a piece of goat's-hair stuff from 3 to 4 feet high, to which a portion of old cloak or *abba* is stitched, and hangs down to the ground : the *rowak* and *sefale* keep out the wind ; the *rowak* is fastened to the tent-covering by the three hind posts, and in winter is carried likewise round the side posts."

2. A wall of stones.—In Stanley's "Sinai and Palestine," Section 85 of the Appendix, he treats of the *chatzer* as an enclosure "formed of tent-cloths spread over stone walls." Some traveller—but the reference has not yet been found—speaks of the low stone walls rudely raised and used by the Bedouins as backing for their tents in their usual camping places.

3. A wall of reeds.—Almost every traveller will recall a neatly-made wall of reeds used by the Bedouins in the neighbourhood of Merom. I remember passing along on the west or rear side of a village having all its tents in a straight line, and every one backed by a wall of reeds standing about 4 feet high, and fastened up as a straw matting might be. In his book on the "Temple and Tabernacle," Boston, 1885, Professor T. O. Paine has inserted a photograph of such a tent, showing how perfectly it is closed by these reeds from wind and observation.

If we may conclude that the tents were and are generally protected in this manner, then we may assume that the boards of the Tabernacle were simply an appropriate way of securing the same end in the construction of that tent.

Cambridge, Mass.

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT TIBERIAS IN THE YEAR 1897.

By James Glaisher, F.R.S.

The numbers in column 1 of this table show the highest reading of the barometer in each month; the highest appear in the winter, and the lowest in the summer months; the maximum for the year was 31·120 inches, in November, and the next in order 31·082 inches, in January.

In column 2 the lowest reading in each month is shown; the minimum for the year was 30·230 inches, in August; and the next in order 30·231 inches, in July.

The range of readings in the year was 0·890 inch. The range in the morning observations was 0·843 inch, being 0·088 inch greater than the range at Jerusalem.

The numbers in the 3rd column show the extreme range of readings in each month; the smallest was 0·263 inch, in July, and the next in order 0·276 inch, in August; the largest was 0·779 inch, in February, and the next in order 0·720 inch, in January.

The numbers in columns 4 and 5 show the mean monthly reading of the barometer at 8 a.m. and 4 p.m.; and those in column 6 the lower reading at 4 p.m. than at 8 a.m.; the smallest difference between these two readings was 0·041 inch, in November, and the next in order 0·048 inch, in December; the largest was 0·095 inch, in October; and the next in order 0·089 inch, in September. In England in January the readings at 8 a.m. and 4 p.m. are practically the same; in all other months the reading at 4 p.m. is lower than at 8 a.m.; the greatest difference is 0·025 inch, in June. The mean for the year at Tiberias was 0·066 inch, being about three times greater than in England.

The numbers in the 7th column show the mean monthly pressure of the atmosphere; the highest was 30·749 inches, in December, and the next in order 30·746 inches, in February; the lowest was 30·375 inches, in July, and the next in order 30·406 inches, in August. The mean for the year was 30·600 inches.

The highest temperature of the air in each month is shown in column 8. The first day in the year the temperature reached 90° was on April 2nd, and there was 1 other day in April on which the temperature reached or exceeded 90°; in May, on 6 days; in June, on 27 days; in July, August, and September it reached or exceeded 90° on every day; and in October, on 18 days; thus the temperature reached or exceeded 90° on 145 days during the year. At Jerusalem the temperature did not reach 90° till June 7th, and there were only 16 days in the year on which the temperature was as high as 90°. At Tiberias the temperature was 102° on June 7th, and reached or exceeded 100° on 2 other days in this month; in July, on 7 days; in August, on 1 day; in September, on

9 days; and in October, on 1 day; thus on 21 days in the year the temperature reached or exceeded 100°. The highest temperature in the air at Tiberias was 109°, on September 19th; at Jerusalem it was 99°, on September 23rd.

On February 14th, 1898, Dr. Torrance wrote saying that he was sorry to state that he just discovered that the minimum thermometer observations made during the year 1897 are untrustworthy, and that he had come to the conclusion that, though probably many of the observations are accurate, they cannot be relied upon; consequently, columns 9, 10, 12, and 13 are blank.

It has been remarked in every year that the mean of the dry-bulb thermometer observations at 8 a.m. in every month agree very closely with the simple mean of the maximum and minimum thermometers, and that the mean temperature could be inferred from the observations at 8 a.m.

The table opposite (p. 73) shows the means of seven years' observations. It will be seen that the mean monthly temperature was generally a little higher than the mean reading of the dry-bulb at 8 a.m. By the application of these numbers to those in column 15 in the general table, the values in column 14 have been inferred.

In column 11 the mean of all the high day temperatures in each month is shown. The lowest was 63°·6 in January, being 11°·4 higher than that at Jerusalem; the next in order were 65°·4 in December, and 69°·1 in February; the highest was 99°·4 in July; and the next in order 99°·1 in September, and 96°·6 in August. At Jerusalem the lowest were 51° in December, 52°·2 in January, and 52°·8 in February; the highest were 88°·6 in September, 85°·5 in July, and 82°·8 in August.

The mean temperature of the air in each month is shown in column 14. The lowest was 56° in January, the next in order were 58°·8 in February, and 58°·9 in December; the highest was 88°·2 in July, and the next in order were 87°·8 in August, and 87°·1 in September. At Jerusalem the lowest temperatures were 46°·3 in December, 47° in February, and 47°·1 in January; the highest were 77°·9 in September, 76°·8 in July, and 73°·0 in August. At Tiberias the mean temperature increased month by month to the maximum in July, then decreased month by month to the end of the year. At Jerusalem the mean temperature increased from February to July, decreased from July to August, increased from August to the maximum in September, then decreased month by month to the end of the year. At Tiberias the yearly value was 72°·6; at Jerusalem it was 61°·3.

The numbers in the 15th and 16th columns are the mean readings of a dry- and wet-bulb thermometer, taken daily at 8 a.m. If those in column 15 be compared with those in column 14, it will be seen that those in column 15 were of the same value in April, a little higher in March and September, and a little lower in all other months. The mean for the year was 72°·1, being 0°·5 less than the mean of column 14. In the year 1899 the mean of the dry-bulb was 1°·1 lower than that of the

Means of the Seven Monthly Mean Temperatures, as found from the Maximum and Minimum Temperatures only, in the preceding Seven Years, viz., 1890 *to* 1896, *and the Monthly Mean of the Dry-Bulb Thermometer at* 8 *a.m. in the same Years, and showing the Excess of Mean Temperature over that at* 8 *a.m. in each Month.*

—	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	°	°	°	°	°	°	°	°	°	°	°	°
Mean temperature	56·3	57·7	61·9	68·5	77·1	83·3	87 3	88·2	84·1	79·6	69·4	61·4
Mean reading of dry-bulb at 8 a.m.	55·2	57·6	62·5	68·5	76·4	82·2	86·7	86·9	84·3	79·4	68·4	60·7
Excess of mean temperature over that at 8 a.m.	+1·1	+0·1	−0·6	0·0	+0·7	+1·1	+0·6	+1·3	−0·2	+0·2	+1·0	+0·7

maximum and minimum thermometers; in 1891 it was 1°·5 lower; in 1892, 0°·4 higher; in 1893, 0°·7 lower; in 1894, 0°·5 lower; and in 1895 0°·1 lower; the mean of the six differences is 0°·6; and therefore the mean temperature of the year may be approximately determined by a single reading of the thermometers taken daily at 8 a.m.

The numbers in the 17th column are the temperature of the dew-point, or that temperature at which the air would be saturated by the quantity of vapour mixed with it; the smallest difference between these numbers and those in column 15 was 3°·8 in January, and the largest 18°·9 in September.

The numbers in column 18 show the elastic force of vapour, or the length of a column of mercury in inches corresponding to the pressure of vapour; the smallest was 0·330 inch in February, and the largest 0·749 inch in July.

In column 19 the weight in grains of the water in a cubic foot of air is shown; it was as small as 3·7 grains in February, and as large as 7·9 grains in July.

In column 20 the additional quantity of water required to saturate a cubic foot of air is shown; it was as small as 0·7 grain in January, and as large as 6·4 grains in September.

The numbers in column 21 show the degree of humidity of the air, saturation being represented by 100; the largest number is 87 in January, and the smallest 54 in September.

The numbers in column 22 show the weight in grains of a cubic foot of air, under the mean atmospheric pressure, temperature, and humidity of the air; the largest number was in January, decreasing to the smallest in July, then increasing again to the end of the year.

In columns 23 and 24 are the mean readings of a dry- and wet-bulb thermometer taken daily at 4 p.m. By comparing the numbers in column 15 with those in column 23, the increase of temperature from 8 a.m. to 4 p.m. is shown; in November the increase was only 2°·4, and in May it was as much as 7°·3.

In column 25 the temperature of the dew-point at 4 p.m. is shown. By comparing these numbers with those in column 17, it will be seen that the temperature of the dew-point in the months of January and February was higher than at 8 a.m., and lower than at 8 a.m. in all other months. The numbers in this column are smaller than those in column 23, by 7°·4 in January, increasing to 28°·9 in September, decreasing to 15° in December; these differences between the temperature of the air and that of the dew-point are very much larger than those at 8 a.m., being in several months more than twice as large.

On several days during the months of April, May, June, July, August, September, and October, at 4 p.m., the reading of the dry-bulb thermometer exceeded that of the wet by 20° or more, and the temperature of the dew-point was from 32°·1 to 52°·4 lower than the temperature of the air, as shown by the following table:—

Month and Day.	Reading of		Temperature of the Dew Point.	Temperature of the Dew Point below Dry.
	Dry.	Wet.		
	°	°	°	°
April 10	85·0	65·0	51·9	33·1
18	86·0	66·0	53·0	33·0
May 7	89·0	69·0	56·4	32·6
18	89·0	67·0	53·1	35·9
20	88·0	68·0	55·2	32·8
24	90·0	69·0	55·8	34·2
June 6	96·0	70·0	54·7	41·3
7	94·0	72·0	58·7	35·3
8	94·0	71·0	57·1	36·9
July 5	95·0	71·0	56·6	38·4
8	94·0	74·0	61·9	32·1
18	95·0	72·0	58·2	36·8
19	95·0	74·0	61·4	33·6
22	95·0	74·0	61·4	33·6
Aug. 25	96·0	75·0	62·6	33·4
27	93·0	71·0	57·6	35·4
28	96·0	75·0	62·6	33·4
Sept. 12	103·0	80·0	67·3	35·7
19	100·0	72·0	56·0	44·0
20	107·0	74·0	56·5	50·5
21	101·0	71·0	54·2	46·8
22	106·0	72·0	53·6	52·4
23	101·0	71·0	54·2	46·8
27	92·0	72·0	59·7	32·3
28	94·0	73·0	60·3	33·7
Oct. 3	92·0	68·0	53·1	38·9
4	93·0	72·0	59·2	33·8
5	96·0	71·0	56·2	39·8

In column 26 the elastic force of vapour is shown, and by comparing the values with those in the same month at 8 a.m. we find that it was smaller at 4 p.m. in the months from March to December, and larger than at 8 a.m. in January and February.

In column 27 the amount of water in a cubic foot of air at 4 p.m. is shown; the amount was less than at 8 a.m. in the months from April to October and in December, of the same value in both February and March, and larger than at 8 a.m. in the remaining months.

In column 28 the amount of water required to saturate a cubic foot of air was as large as 10·4 grains in September, 9 grains in July, and 8·6 grains in August, and smaller than 2 grains in January.

In column 29 the degree of humidity is shown; the driest months are from April to October, the value for these months varying from 39 in September, to 48 in April.

In column 30 the weight of a cubic foot of air is shown; the smallest was 507 grains, in August, and the largest 547 grains, in both January and December.

In column 31 are given the number of days of rain in each month; the greatest number was 14, in February. The total number in the year was 57. At Jerusalem rain fell on 72 days.

In column 32 the monthly fall of rain is given. The heaviest fall of rain on one day in the months from January to April was 2·72 inches, on January 5th; and the next in order were 2·30 inches on January 2nd, and 2 inches on March 22nd. No rain fell from May 25th till October 29th, making a period of 156 consecutive days without rain. The fall of rain on both December 3rd and 12th was 1·00 inch. The heaviest monthly fall in the year was 11·21 inches, in January, and the next in order, 6·74 inches, in December. The total fall for the year was 27·72 inches. At Jerusalem the total fall for the year was 41·62 inches.

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT JERUSALEM IN THE YEAR 1897.

By James Glaisher, F.R.S.

The numbers in column 1 of this table show the highest reading of the barometer in each month; of these the highest, as usual, are in the winter, and the lowest in the summer months; the maximum for the year was 27·735 inches, in November, and the next in order, 27·680 inches, in January. The highest reading in the preceding 36 years, viz., 1861 to 1896 inclusive, was 27·816 inches, in December, 1879.

In column 2 the lowest reading of the barometer in each month is shown; the minimum for the year was 26·980 inches, in March, and the next in order, 27·119 inches, in January. The lowest reading in the preceding 36 years was 26·970 inches, in March, 1896.

The numbers in the 3rd column show the extreme range of readings in each month; the smallest was 0·159 inch, in October, and the next in order, 0·178 inch, in July; the largest was 0·641 inch, in March, and the next in order, 0·561 inch, in January. The mean monthly range for the year was 0·347 inch. The mean for the preceding 36 years was 0·310 inch.

The range of barometer readings in the year was 0·755 inch. The largest range in the preceding 36 years was 0·742 inch, in 1876; and the smallest, 0·491 inch, in 1883.

The numbers in the 4th column show the mean monthly pressure of the atmosphere; the highest was 27·505 inches, in November, and the next in order, 27·475 inches, in December; the lowest was 27·262 inches, in July, and the next in order, 27·289 inches, in August. The mean yearly pressure was 27·394 inches. The highest mean yearly pressure in the preceding 36 years was 27·442 inches, in 1863, and the lowest, 27·357 inches, in 1894. The mean for the 36 years was 27·390 inches.

The temperature of the air reached 90° on June 7th, and there was one other day in June when the temperature reached or exceeded 90°. In the preceding 15 years the earliest day in the year the temperature was 90° was March 25th in the year 1888; in July it reached or exceeded 90° on 1 day; in September, on 12 days; and in October, on 1 day, the 7th, this being the last day in the year the temperature was 90°. In the preceding 15 years the latest day in the year this temperature reached 90° was October 23rd, 1887. The temperature reached or exceeded 90° on 16 days during the year. In the year 1892 the number of days of this high temperature was 23, and in 1887 was 73; the average of the 15 years was 39. The highest temperature in the year was 99°, on September 23rd; the highest in the preceding 15 years, viz., 1882 to 1896, was 108°, in June, 1894.

The temperature of the air was as low or lower than 40° in January on 8 nights; in February on 12 nights; in March on 4 nights; in November on 6 nights; and in December on 6 nights. Thus the temperature was as low or lower than 40° on 36 nights during the year. In the year 1892 the number of nights of this low temperature was 19, and in 1894 was 113; the average of the 15 years was 56. The lowest temperature in the year was 25° on December 31st; the lowest in the preceding 15 years, viz., 1882 to 1896, was 26°·5, in January, 1890.

The highest temperature of the air in each month is shown in column 5. In December it was 59°·5, being the lowest in the year, and 7°·7 below the mean of the 15 high day temperatures in December. The high day temperature was also below its average in March, April, May, July, August, October, and November, and above in the remaining months. The mean for the year was 80°·3, being 3°·7 below the average of 15 years.

The lowest temperature of the air in each month is shown in column 6. In December it was 25°, being the lowest in the year, and 8°·6 below the average. The low night temperature was also below its average in February, May, June, October, and November, and above in the remaining months. The mean for the year was 44°·5, being 0°·1 above the average of 15 years.

The range of temperature in each month is shown in column 7; the numbers vary from 26° in January to 47°·8 in June. The mean range for the year was 35°·8, being 3°·8 less than the average of 15 years.

The range of temperature in the year was 74°. The largest in the preceding 15 years was 81°, in 1894; and the smallest, 63°·5, in the year 1885.

The mean of all the high day temperatures in each month is shown in column 8. The lowest was 51°, in December, being 5°·7 lower than the average. The highest was 88°·6, in September, being 3°·3 higher than the average. The mean for the year was 69°·4, being 2°·8 below the average of 15 years.

The mean of all the low night temperatures in each month is shown in column 9. The lowest was 41°·1, in February, being 1°·4 higher than

the average; the highest was 67°·3, in September, being 6°·5 higher than the average. The mean for the year was 53°, or 0°·6 above the average of 15 years.

In column 10 the mean daily range of temperature in each month is shown; the smallest was 9°·4, in December; and the next in order, 10°·3, in January; the greatest was 23°·2, in June, and the next in order, 21°·3, in September. The mean for the year was 16°·4, being 3°·4 less than the average. The smallest ranges in the preceding 15 years were 9°·3, in January, 1883, and 9°·7, in December, 1890; the greatest were 33°·8, in August, 1886; and 30°·1, in August, 1887. The smallest mean for the year was 17°·2, in 1896; and the greatest, 24°·3, in 1886.

The mean temperature of the air, as found from the maximum and minimum temperatures only, is shown in each month in column 11; the lowest was 46°·3, in December; and the next in order, 47°·0, in February, and 47°·1 in January; the highest was 77°·9, in September; and the next in order, 76°·8, in July, and 73° in August. The mean for the year was 61°·3, being 1° below the average of 15 years. The lowest mean temperatures in the preceding 15 years were 39°·8, in January, 1890; and 42°, in December, 1886; the highest were 81°·2, in August, 1890, and 81°·1, in July, 1888. The highest mean for the year was 63°·7, in 1885, and the lowest, 60°, in 1894.

December was the coldest month of the year, and was below its average both by day and night.

The numbers in column 12 are the mean readings of a dry-bulb thermometer. If those in column 12 be compared with those in column 11, it will be seen that those in column 12 are a little higher in every month, the difference of the means for the year being 2°·0; the mean difference between the mean temperature of the air and that at 9 a.m. for the 15 years was 3°·3.

For a few days in the winter months the dry- and wet-bulb thermometers read alike, or nearly so, but in the months from April to October the difference between the readings often exceeded 15°, and was as large as 27° on June 7th.

In column 13 the mean monthly readings of the wet-bulb are shown; the smallest differences between these and those of the dry-bulb were 3°·2, in January, and 3°·6, in February; the largest were 14°·1, in July, and 12°·9, in September. The mean for the year was 55°·4, and that of the dry-bulb 63°·4; the mean difference was 8°.

The numbers in column 14 are the mean temperature of the dew-point, or that temperature at which the air would be saturated by the quantity of vapour mixed with it; the smallest difference between these numbers and those in column 12, were 6°·7, in January, and 7°·6, in February; and the largest were 23°·8, in July and 21°·7, in September. The mean temperature of the dew-point for the year was 49°; the mean for the 15 years was 50°·2.

The numbers in column 15 show the elastic force of vapour, or the length of a column of mercury in inches corresponding to the pressure

of vapour; the smallest was 0·213 inch, in December; and the largest, 0·505 inch, in August. The mean for the year was 0·359 inch; the average of the 15 years was 0·376 inch.

In column 16 the weight in grains of the water present in a cubic foot of air is shown; it was as small as $2\frac{1}{2}$ grains in December, and as large as $5\frac{1}{2}$ grains in August. The mean for the year was 4 grains; the average of the 15 years was 4·1 grains.

In column 17 the additional quantity of water required to saturate a cubic foot of air is shown; it was as small as 0·8 grain in January, and as large as 5·9 grains in July. The mean for the year was 3·0 grains, the average of the 15 years was 3·3 grains.

The numbers in column 18 show the degree of humidity, saturation being represented by 100; the largest numbers appear in January, February, March, November, and December, and the smallest from April to October; the smallest of all was 44 in July. The mean for the year was 62; that of the 15 years was 59.

The numbers in column 19 show the weight in grains of a cubic foot of air, under its mean atmospheric pressure, temperature, and humidity. The largest number was 502 grains in December, and the smallest, 468 grains in both July and September. The mean for the year was 485 grains; that of the 15 years was 482 grains.

The most prevalent winds in January were S.W. and N.W., and the least prevalent wind was S.; the most prevalent in February were W., S.W., and N.W., and the least was S.; the most prevalent in March were N.W., S.W., and W., and the least were N. and S.E.; the most prevalent in April was N.W., and the least was S.; the most prevalent in May were N.W. and W., and the least was N.E.; the most prevalent in June, July, and August were N.W. and W., and the least were N.E., E., S.E., and S.; the most prevalent in September was N.W., and the least was S.; the most prevalent in October was N.W., and the least were N.E., S.E., and S.; the most prevalent in November were N.E., W., and N.W., and the least were S.E. and S.; the most prevalent in December were N.W. and S.W., and the least were S.E. and S. The most prevalent wind in the year was N.W., which occurred on 147 times, of which 20 were in July, 18 in October, and 17 in June, and the least prevalent wind was S., which occurred on only 4 times during the year, viz., once in March and 3 times in May.

The total number of times of each wind are shown in the last line of columns 20 to 27; those winds less in number than the average of the preceding 15 years were—

N.	by	13
N.E.	„	15
E.	„	4
S.E.	„	15
S.	„	5
S.W.	„	1

and those winds greater in number than the average of 15 years were—

W. by 21
N.W. ,, 32

The numbers in column 28 show the mean amount of cloud in each month; the month with the smallest amount is July, and the largest January. Of the cumulus or fine weather cloud there were 5 instances; of the nimbus or rain cloud there were 33 instances, of which 8 were in both January and February; of the cirrus there were 16 instances; of the stratus 4 instances; of the cumulus stratus 92 instances, of which 17 were in May, 14 in December, and 13 in April; of the cirro cumulus 56 instances; of the cirro stratus 11 instances; and 148 instances of cloudless skies, of which 26 were in July, 24 in June, and 20 in September, and 4 only in January.

The largest fall of rain for the month in the year was 14·46 inches, in January, of which 2·37 inches fell on the 7th, 2·20 inches on the 6th, and 1·92 inch on the 22nd. The next largest fall for the month was 8·18 inches, in March, of which 2·25 inches fell on the 23rd, and 2·02 inches on the 13th. No rain fell from May 26th till October 20th, making a period of 146 consecutive days without rain. The total fall of rain for the year was 41·62 inches, being 15·80 inches above the average of 36 years, viz., 1861 to 1896. The number of days on which rain fell was 72, being 16 more than the average.

THE PALESTINE EXPLORATION FUND.

NOTES AND NEWS.

We publish in the present number Dr. Bliss's second report of the excavations, which covers the period up to December 21st, 1898, when the work was stopped by the advent of the heavy winter rains. The drawings of the objects found are by Mr. Macalister. The operations at Tell Zakarîya were recommenced on March 20th.

Among other interesting notes, Dr. Schick has sent in a plan and description of the most recent discoveries at Jacob's Well, which we hope to publish shortly.

Dr. Torrance writes from Tiberias:—"Roman glass, coins, jewellery, and occasionally statuettes, are still found by the Fellahîn in the villages around the lake, especially Fîk and Kefr Haub, but I have not seen anything of special value. Probably many things of interest will be found in connection with the excavations and cuttings along the line of the Haifa–Damascus Railway, which I am glad to say is recommenced. The summer during the past year in Tiberias was unusually mild, but the autumn was very hot and trying, and, after the commencement of the rains, dysentery and malaria were very prevalent amongst all sections of the community, European and native. Measles and diphtheria have also been prevalent, but no small-pox. For the first time for about twenty years the Rawalli Arabs came west of the Jordan in October of last year. They made a detour round the Sea of Galilee with their camels,

numbering considerably over 100,000 I should think. On the east they had nothing to eat, and were driven by hunger to the west. Young camels were sold in Tiberias for the merest trifle, many for a medjedie = 3*s.* 4*d.*, and some sick and hungry ones for a beslick, about 6*d.*!

"Our hospital work is having a wide-reaching influence. Besides townspeople we come in contact with Arabs from nearly every tribe in the east of Syria."

Dr. Torrance also reports:—"A month ago a great flight of locusts passed over Tiberias, the swarm taking the greater part of two days to pass. Flamingoes settle on the Sea of Galilee. I shot a beautiful specimen in the neighbourhood of Tiberias." (*See* Survey of Western Palestine, "Fauna and Flora," p. 113.)

We are informed by Mr. Pilling that the construction of the Acre–Damascus Railway is at length assured. Arnold F. Hills, Esq., of the Thames Ironworks, under contract with the railway company, has taken over the control of this most important and interesting enterprise. The works of construction have been already resumed on an extensive scale. It is anticipated the first section of 61 miles from Acre and Haifa to the River Jordan will be opened for public traffic before this time next year. Our Committee have made arrangements with Dr. Schumacher for the prompt and regular transmission of information respecting discoveries likely to interest our readers which may be made in carrying on the work.

Owing to pressure on our space the publication of the Rev. John Zeller's paper on "The Bedawîn" is postponed.

The Committee are glad to say that they have received the remainder of the MS. of Professor Ganneau's "Archæological Researches in Jerusalem and its Neighbourhood." The MS. has been translated, and is now in the press.

Dr. Bliss's detailed account of his three years' work at Jerusalem, published as a separate volume, with the title

"Excavations at Jerusalem, 1894–1897," and copiously illustrated with maps and plans, may be procured at the office of the Fund. Price to subscribers to the work of the Fund, 8*s.* 6*d.*, post free.

Subscribers in U.S.A. to the work of the Fund will please note that they can procure copies of any of the publications from Rev. Professor Theo. F. Wright, Honorary General Secretary to the Fund, 42, Quincy Street, Cambridge, Mass.

The Museum at the office of the Fund, at 38, Conduit Street (a few doors from Bond Street), is open to visitors every week-day from 10 o'clock till 5, except Saturdays, when it is closed at 2 p.m.

The income of the Society, from December 23rd, 1898, to March 23rd, 1899, was—from Annual Subscriptions and Donations, including Local Societies, £701 17*s.* 2*d.*; from Lectures, £4 7*s.* 6*d.*; from sales of publications, &c., £266 6*s.* 7*d.*; total, £972 11*s.* 3*d.* The expenditure during the same period was £910 14*s.* 4*d.* On March 23rd the balance in the Bank was £745 1*s.* 3*d.*

The price of a complete set of the translations published by the Palestine Pilgrims' Text Society, in 13 volumes, with general index, bound in cloth, is £10 10*s.* A catalogue describing the contents of each volume can be had on application to the Secretary, 38, Conduit Street.

It may be well to mention that plans and photographs alluded to in the reports from Jerusalem and elsewhere cannot all be published, but all are preserved in the office of the Fund, where they may be seen by subscribers.

Branch Associations of the Bible Society, all Sunday Schools within the Sunday School Institute, the Sunday School Union, and the Wesleyan Sunday School Institute, will please observe that by a special Resolution of the Committee they will henceforth be treated as subscribers and be allowed to purchase the books and maps (by application only to the Secretary) at reduced price.

The Committee acknowledge with thanks the following donations to the Library of the Fund :—

"Monuments Égyptiens, Notice Sommaire," and "Bronzes et Bijoux, Catalogue Sommaire." Constantinople, 1898. From Hamdy Bey, Director-General of the Musée Impérial Ottoman, Constantinople.

"Babylonian Expedition of the University of Pennsylvania." Vol. IX. Edited by H. V. Hilprecht. Pennsylvania, 1898.

"Rente et Dette chez les Hébreux," "Du Bimétallisme chez les Hébreux," "Les Quinze divisions des Saints Évangiles," and "La Table des Psaumes." From the Author, Vicomte François de Salignac Fénelon.

The Committee will be glad to receive donations of Books to the Library of the Fund, which already contains many works of great value relating to Palestine and other Bible Lands. A catalogue of Books in the Library will be found in the July *Quarterly Statement*, 1893.

While desiring to give publicity to proposed identifications and other theories advanced by officers of the Fund and contributors to the pages of the *Quarterly Statement*, the Committee wish it to be distinctly understood that by publishing them in the *Quarterly Statement* they neither sanction nor adopt them.

In order to make up complete sets of the "Quarterly Statement" the Committee will be very glad to receive any of the back numbers.

Subscribers who do not receive the *Quarterly Statement* regularly are asked to send a note to the Acting Secretary. Great care is taken to forward each number to those who are entitled to receive it, but changes of address and other causes occasionally give rise to omissions.

The Committee of the Palestine Exploration Fund desire to make clear that they have no book on their List of Publications called "Picturesque Palestine," nor is any person authorised to represent this book as published by the Society; nor has the Society any book-hawkers in its employment.

Tourists are cordially invited to visit the Loan Collection of "Antiques" in the Jerusalem Association Room of the Palestine Exploration Fund, opposite the Tower of David, Jerusalem. Hours: 8 to 12, and 2 to 6. Maps of Palestine and Palestine Exploration Fund publications are kept for sale.

Photographs of Dr. Schick's models (1) of the Temple of Solomon, (2) of the Herodian Temple, (3) of the Haram Area during the Christian occupation of Jerusalem, and (4) of the Haram Area as it is at present, have been received at the office of the Fund. Sets of these photographs, with an explanation by Dr. Schick, can be purchased by applying to the Secretary, 38, Conduit Street, W.

The authorised lecturers for the Society are—

America.

Professor Theodore F. Wright, Ph.D., 42, Quincy Street, Cambridge, Mass., Honorary General Secretary of the Palestine Exploration Fund for the United States. His subjects are as follows:—

(1) *The Buried City of Jerusalem.*
(2) *Discoveries in Palestine.*

ENGLAND.

The Rev. Thomas Harrison, F.R.G.S., The Vicarage, Appledore, Ashford, Kent. His subjects are as follows:—

(1) *Research and Discovery in the Holy Land.*
(2) *Bible Scenes in the Light of Modern Science.*
(3) *The Survey of Eastern Palestine.*
(4) *In the Track of the Israelites from Egypt to Canaan.*
(5) *The Jordan Valley, the Dead Sea, and the Cities of the Plain.*
(6) *The Recovery of Jerusalem*—(*Excavations in* 1894).
(7) *The Recovery of Lachish and the Hebrew Conquest of Palestine.*
(8) *Archæological Illustrations of the Bible.* (Specially adapted for Sunday School Teachers.)

N.B.—All these Lectures are illustrated by specially prepared lantern slides.

The Rev. Charles Harris, M.A., F.R.G.S., Appledore, Ashford, Kent. (All Lectures illustrated by lantern slides.) His subjects are as follows:—

(1) *Modern Discoveries in Palestine.*
(2) *Stories in Stone; or, New Light on the Old Testament.*
(3) *Underground Jerusalem; or, With the Explorer in* 1895.

Bible Stories from the Monuments, or Old Testament History in the Light of Modern Research:—

(4) A. *The Story of Joseph; or, Life in Ancient Egypt.*
(5) B. *The Story of Moses; or, Through the Desert to the Promised Land.*
(6) C. *The Story of Joshua; or, The Buried City of Lachish.*
(7) D. *The Story of Sennacherib; or, Scenes of Assyrian Warfare.*
(8) E. *The Story of the Hittites; or, A Lost Nation Found.*

SCOTLAND.

The Rev. James Smith, B.D., F.S.A., F.R.G.S., St. George's-in-the-West Parish, Aberdeen. (All Lectures are illustrated with lantern slides, many of which are coloured.) His subjects are as follows:—

(1) *The Palestine Exploration Fund.*
(2) *A Pilgrimage to Palestine.*
(3) *Jerusalem—Ancient and Modern.*
(4) *The Temple Area, as it now is.*
(5) *The Church of the Holy Sepulchre.*
(6) *A Visit to Bethlehem and Hebron.*
(7) *Jericho, Jordan, and the Dead Sea.*

The Rev. W. Burnet Thomson, M.A., B.D., Galashiels, N.B. His subjects are as follows:—

(1) *The City of the Great King; or, Jerusalem and the Explorer.*
(2) *The Temple, the Sepulchre, and Calvary.*
(3) *Southern Palestine.*
(4) *Jerusalem to Damascus.*
(5) *Palestine and Jesus Christ* (*for children*).
(6) *The Bible and the Monuments. Discoveries in Ancient Land.*

All illustrated with lantern slides.

Wales.

The Rev. J. Llewelyn Thomas, M.A., Aberpergwm, Glynneath, South Wales. His subjects are as follows:—

(1) *Explorations in Judea.*
(2) *Research and Discovery in Samaria and Galilee.*
(3) *In Bible Lands; a Narrative of Personal Experiences.*
(4) *The Reconstruction of Jerusalem.*
(5) *Problems of Palestine.*

STATEMENT OF RECEIPTS AND EXPENDITURE FOR THE YEAR ENDING 31ST DECEMBER, 1898.

Receipts.	£	s.	d.
To Balance in Bank 31st December, 1897— £596 14 10			
Balance in hand 48 10 4			
	645	5	2
Legacy left by the late Henry Smiles, Esq. ..	100	0	0
Donations and Subscriptions	1,871	2	6
Proceeds of Lectures	46	14	1
Sales of Books, Maps, Photographs, Casts, and Lantern Slides	582	9	3
	£3,245	11	0

Expenditure.	£	s.	d.
By Exploration	695	5	4
Printing, Binding, including *Quarterly Statement*	652	9	11
Maps, Lithographs, Illustrations, Photographs, Casts, Lantern Slides, &c.	145	11	11
Advertising, Insurance, Stationery, and Sundries	83	2	7½
Postage of the *Quarterly Statement*, Books, Maps, &c.	121	1	10½
Salaries and Wages	398	19	6
Office Rent, Gas, Coals, removing from 24, Hanover Square, New Furniture, and Repairs ..	474	10	9
Balance in Bank, including £33 17*s.* 6*d.* subscriptions paid in advance for 1899	674	9	1
	£3,245	11	0

Examined and compared with Vouchers, and Cash and Bank Books and found correct.

Walter Morrison, *Treasurer.*

TREASURER'S STATEMENT.

The income of the Fund for 1898 amounted to £2,600 5*s.* 10*d.*, made up as follows :—

From Legacy left by the late Mr. Henry Smiles, £100; from Donations and Subscriptions, £1,871 2*s.* 6*d.*; from sales of publications, £582 9*s.* 3*d.*; from Lectures, mainly delivered by Dr. Bliss in America while waiting for the Firman, £46 14*s.* 1*d.*

At the end of 1897 there was a balance in the bank of £645 5*s.* 2*d.*, making the total amount available for the year, £3,245 11*s.* 0*d.*

The expenditure was :—

On exploration, £695 5*s.* 4*d.* Owing to the delay in getting the Firman the excavation work was not begun until late in the year.

On printing, binding, including the *Quarterly Statement*, the new work "Excavations at Jerusalem," new edition of "Mound of Many Cities," "Judas Maccabæus," &c., £652 9*s.* 11*d.*

On maps, lithographs, illustrations, photographs, &c., £145 11*s.* 11*d.* Against these two sums the Fund received from the sale of all publications, £582 9*s.* 3*d.*

On advertising, insurance, stationery, &c., £83 2*s.* 7½*d.*

On postage of books, maps, &c., including the *Quarterly Statement*, £121 1*s.* 10½*d.*

The management, including rent of office, cost of removing from 24, Hanover Square, dilapidations, new furniture, repairs, &c., £873 10*s.* 3*d.*

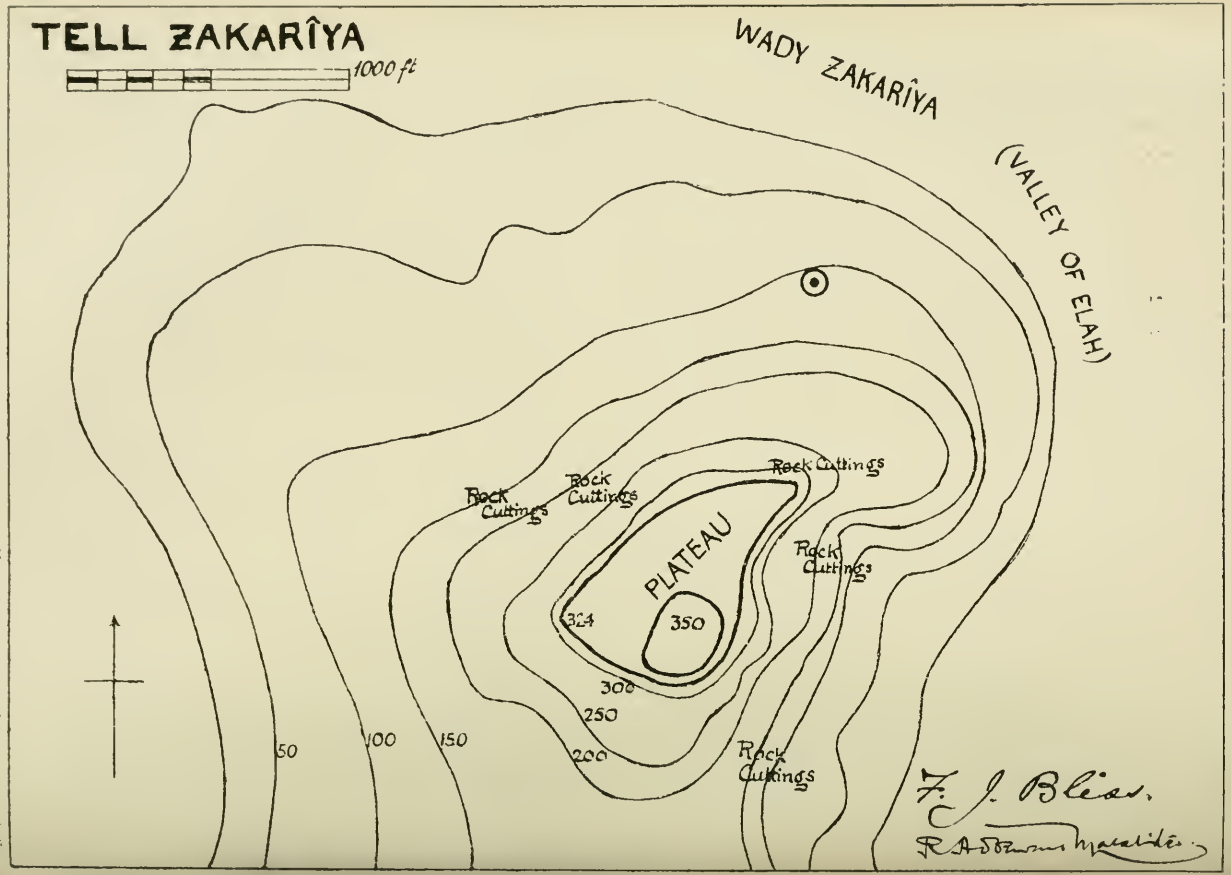
At the end of the year the balance in the Bank was £674 9*s.* 1*d.*

Special expenses were incurred during the year in consequence of the office being removed to 38, Conduit Street, W. During the quarter in which this took place rent had to be paid for both the old and present offices.

Assets.	£	*s.*	*d.*
Balance in Bank, December 31st, 1898.. ..	674	9	1
Stock of Publications in hand, Surveying Instruments, Show Cases, Furniture, &c.			
In addition there is the valuable library and the unique collection of antiques, models, &c.			

Liabilities.	£	*s.*	*d.*
Printer's Bill	105	15	1
Current Expenses.			

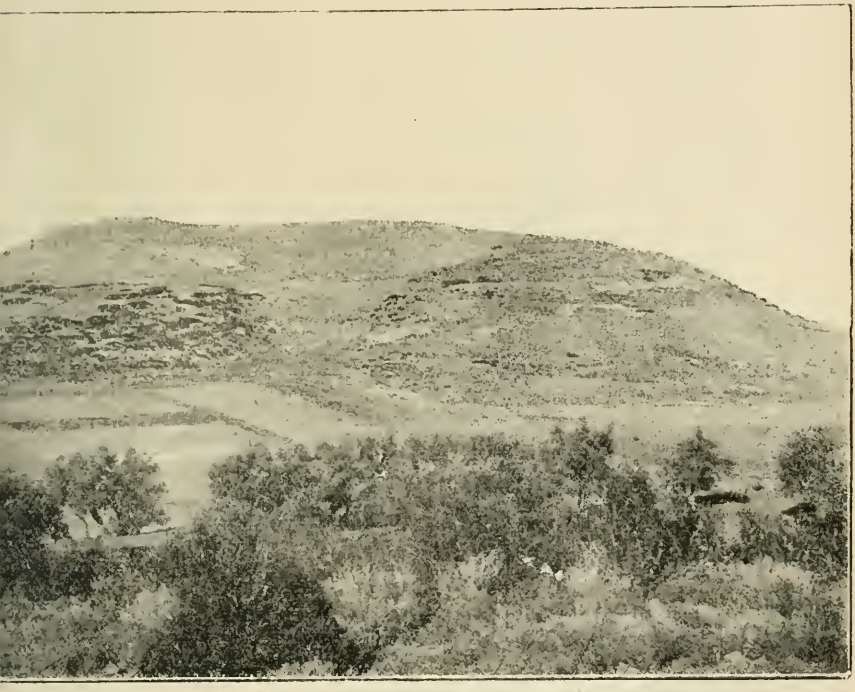
Walter Morrison, *Treasurer.*



SECOND REPORT ON THE EXCAVATIONS AT TELL ZAKARÎYA.

By F. J. Bliss, Ph.D.

As the large fortress or enclosure occupying the south-eastern portion of Tell Zakarîya had not been fully traced at the time of posting the last report, I was obliged to confine myself to a



View of Tell Zakarîya from the East.

few general statements. A report written in moments snatched from the work, before careful and final measurements have been taken, is liable to contain errors, and I find that some of the measurements given are inexact, the fortress being larger than stated there. The plan now submitted shows the building as traced up to Christmas, when we had recovered the whole

outline as it was when finally ruined, except a small portion of the east side. At this portion the excavation is slow and complicated for two reasons: the ruin is great owing to its position on the steepest slope of the Tell, and the later line appears to have diverged from the earlier.

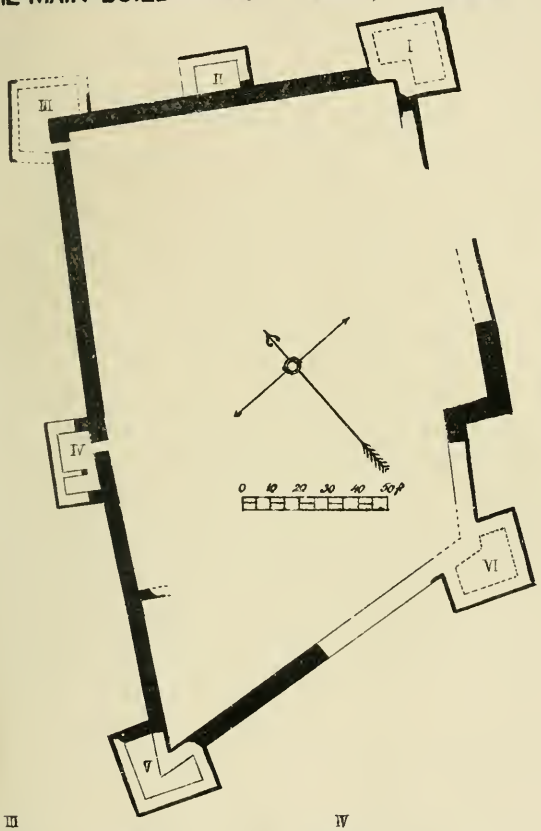
The method of excavation was as follows:—When we first arrived we found an extended mound on the south-east part of the Tell, but the only actual signs of building consisted of a course of stones, projecting from the surface here and there between what turned out later to be Towers II and III, and Towers III and IV. The clue being thus given, we speedily ascertained the thickness of the walls at various points, and thus were able to run trenches, from 2 to 10 feet deep, along their outside and inside faces. These trenches were deepened to the rock at an angle of all the towers, except Tower VI, and at four places along the main wall. Wherever tested, both main wall and towers were found to rest on the rock, except part of the inside wall of Tower IV, which rests on a rude mass of stone, forming the sill of the door and extending under both jambs, as well as under the doorway between the two chambers of the tower itself. In cases where walls are traced along both their inside and outside faces, these are indicated on the plan by solid black; a heavy black line indicates that only the outside face was traced; a thin black line shows that though the line was not excavated yet its course is practically certain; and a dotted line shows the *probable* course of an unexcavated line, for example, where the thickness of a wall was not ascertained, the inside face is dotted in, giving to the wall the thickness found at other points.

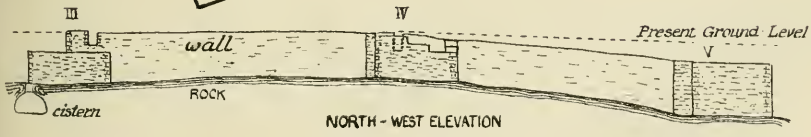
The excavation, thus, was comparatively simple, and a visitor to-day could see the outline of the building merely by walking over the mound. In the open trenches may be seen the full extent of the north and east walls, the complete outlines of Towers I and V, all but a small part of Towers II and IV, and the main angles of Towers III and VI. We searched for doors connecting Towers I and II with the main building, at levels both higher and lower than those of the sill of the door into Tower III, but no entrance was found. A door was found connecting the fortress with Tower IV, and also a thin partition,

PLATE I.

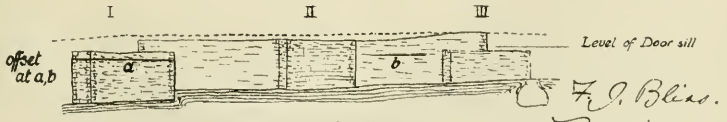
TELL ZAKARÎYA EXCAVATION

THE MAIN BUILDING AS TRACED, DECEMBER 1898





NORTH - WEST ELEVATION



NORTH - EAST ELEVATION

F. J. Bliss.

Marun, Hood & Larkin, Photolitho, Gt Newport St, W C

inside the tower, dividing it into two chambers of unequal size, connected by a doorway. These doorways, as well as the one into Tower III, are mere openings in the wall, roughly silled, with no signs of door-sockets or other indications as to the fitting in of the door itself. The wall at Tower V is ruined below the levels of the above-mentioned sills, and if any opening existed it is probably gone: at any rate we failed to find one in an especial deepening of the trench. Search for a central south tower, *i.e.*, between Towers V and VI, was unsuccessful. The wall is much ruined here, but we proved that no tower was ever bonded into it. Towers III, IV, V, and VI are bonded into the wall, while at Tower I the question is complicated by a repair in the building to be more fully investigated. But Tower II was apparently a later addition, as the main wall runs back of it (at least to a depth of 5 feet on the east side), and contains a plastered stone concealed by the side wall of the tower. If a similar tower was ever added on to the south wall it has entirely disappeared. Only about half the south wall was traced, for as we went towards Tower VI the remains were found deeper and deeper, and the soil was very unfit for tunnelling, containing stone chippings, as well as many well-squared stones of soft limestone, marked with the droving iron. However, the wall was picked up again in a shaft which hit immediately upon the angle it forms with Tower VI. The west and south sides of this tower were traced in a tunnel terminating in the open air at the south-east corner, which occurs on the slope of the Tell. The door to this tower was not looked for. Instead of a central tower on the east side there is a long projection, the extent of which has not yet been determined. The outline of the building as described thus far was the one existing during its latest period. Signs of an earlier period, following a different line, have been observed near Tower I, but the matter awaits further excavation.

Though doors were found connecting the fortress with Towers III and IV, no entrance has been found to the building from the outside. Our excavations have proved that there was no opening in the north wall, or in the west wall between Towers III and IV, at least at the levels of the entrances to these towers. Between Towers IV and V the ruin of the wall

gradually becomes greater, and it is possible that a doorway once existed beyond the point where the top of the remaining wall is below the level of the above-mentioned door-sills, as some entrance from the plateau would be expected. That the main approach from the plain may have been from the south is suggested by a glance at the plan of Tell Zakarîya now published. This plan is the result of a carefully-chained and levelled survey by Mr. Macalister, with the 50-feet contours laid down in thin black lines, and with the edge of the plateau and the edge of the superimposed mound containing the fortress in heavy black lines. The Tell rises abruptly from the surrounding country on all sides but the south. The Wady Zakarîya (a part of the Wady es-Sunt, or Valley of Elah) is taken as the zero point, the lowest point of the plateau being 324 feet, and the highest point of the superimposed mound being 350 feet above the valley. The steepest incline is at the east, while at the south the Tell is connected with another hill by a broad neck of land, from 150 to 200 feet above the level of the valley, thus forming a natural break in the ascent. Unfortunately, the south wall of the building is in such a state of ruin that no entrance could be found. I may notice here that the five principal groups of rock-cuttings described by Mr. Macalister in the January *Quarterly* are marked on this plan.

In studying this fortress we are struck with the lack of symmetry in its construction. Measured on the inside the north wall is 120 feet long; the west wall 228 feet; the south wall 130 feet: while the linear distance between Towers I and VI (at the east side) is about 170 feet. The west wall is at right angles with the north wall, from the north-west angle of the building as far as the point of junction with Tower IV, a distance of 103 feet, where it turns through an angle of five degrees. Just at this point a vertical joint, broken at one place only, occurs in the rough rubble of the inside face, the masonry at one side of the joint differing somewhat from that of the other. It is possible that the building may have been originally about square, the original south wall having been destroyed, and an addition built on to the west wall, thus extending its length to 228 feet. The acute angle at the south-west corner of the building appears to be due to

the conformation of the rock, for, had the south wall run at right angles to the west wall from this point, Tower VI would have occupied a position far down the slope of the hill. (*See* plan of summit-plateau, January *Quarterly*.)

A lack of exactness in building is shown by the smaller measurements. With the exception of Tower II (apparently a later addition), whose face is much shorter—25 feet—the faces of the towers appear to have been designed to have the same length, but they actually vary from 29 feet 6 inches to 32 feet 1½ inches, the lengths of eight different faces being: 29 feet 6 inches, 29 feet 10 inches, 30 feet 6 inches, 31 feet 2 inches, 31 feet 6 inches, 31 feet 6 inches, 31 feet 7 inches, and 32 feet 1½ inches. The projection of the towers varies from 13 feet 6 inches to 16 feet 9 inches; the length of nine different projections being: 13 feet 6 inches, 15 feet, 15 feet, 15 feet 6 inches, 16 feet, 16 feet, 16 feet, 16 feet, and 16 feet 9 inches. These variations may be partly due to the fact that the measurements were taken at different levels, owing to a varying condition of ruin. The thickness of the main wall was measured at several points, and found to be: 5 feet 9 inches, 5 feet 10 inches, 6 feet, 6 feet 3 inches, 6 feet 6 inches, 6 feet 7 inches, and 7 feet 6 inches respectively: the last measurement, however, was taken at a point on the east side where the wall is ruined down far below the original ground-level, where a greater thickness would be expected. The thickness of the tower walls varies from 4 feet 8 inches to 5 feet 3 inches.

The main walls of the building are formed of roughly-coursed rubble laid in mud, containing some well-worked stones, irregularly intermingled with field stones of various sizes. The maximum size may be deduced from the following measurements, taken from larger stones selected here and there:—2 feet 10 inches by 1 foot 7 inches, 2 feet 10 inches by 2 feet 2 inches, 3 feet 3 inches by 1 foot 3 inches, 5 feet 1 inch by 1 foot 9 inches. We have mentioned the slight change of masonry at the vertical joint in the inside face of the west wall at the point of junction with Tower IV. Immediately to the left (*i.e.*, the south) of the joint the masonry appears to be better set. In a course near the rock it contains a drafted stone, on which another drafted stone rests, boss downwards,

apparently taken from some other place. Shafts were sunk to the rock at the angles of Towers IV and V, but the wall between was examined only by a trench of no great depth. The stones in the part uncovered gradually diminish in size from north to south, and the proportion of little field stones increases; the masonry is at first random rubble brought to courses, but afterwards it is uncoursed. From the north-west elevation (*see* Plate 1) it will be seen that between Towers IV and V the wall is ruined to a greater depth than further north, and it is quite possible that the missing courses may have been originally continuous. This view is strengthened by the fact that in general the uncoursed part falls below the levels of the sills of the doors connecting the main building with Towers III and IV.

The south and east walls consist of rough rubble of varying size, brought to courses, but there are two well-worked stones at the outer angle of the eastern projection. Beyond this course the line of the rough foundations (which are all that remain) is very irregular, but a distinct change in the angle is noticeable.

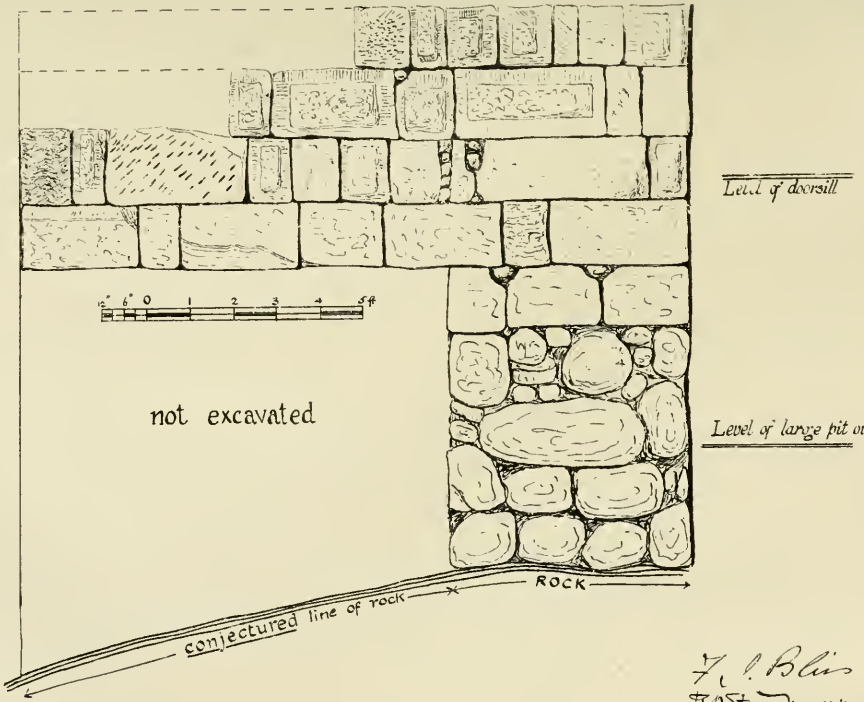
In general the masonry of the towers, as excavated, consists of fairly large rubble brought to courses, with well-squared stones at the external angles. Most of the masonry remaining appears to have been below the original ground-line, except at Tower IV, where four of the five courses of well-squared stones were probably above the ground-line. At Tower I a shaft was sunk to the rock at the east external angle, revealing an offset measuring 7 inches on the north side and 3 inches on the east. Below this, to the rock, we observe large drafted stones with prominent bosses, badly set. At the other angles we find well-squared masonry, extending in two cases for a few feet along the tower faces. For the rest the stones are rubble, occasionally interspersed with bossed stones, and containing at two points a stone covered with plaster, in one case ornamented, in a pattern consisting of squares.

Towers II and III appear to be of the same construction, but the masonry revealed in the shafts sunk to the rock at the east outer angle of Tower II and at the west outer angle of Tower III contains some flush-drafted or vermiculated stones.

PLATE 2.

TELL ZAKARÎYA EXCAVATION

ELEVATION OF THE S.-W. SIDE (OUTER FACE) CENTRAL N.-W. TOWER (No. 4)



F. J. Bliss.
R. A. Stewart Macalister

PALESTINE EXPLORATION FUND.

A shaft was sunk to the rock at the junction made by Tower IV with the wall running south, and the upper part of the whole south-west side was laid bare, including, probably, all that remains of the masonry originally above the ground-line (*see* Plate 2). At the junction 13 feet of the wall remain standing, showing 5½ feet of rubble above the rock, on which are five courses of stones squared and dressed, averaging 18 inches in height; the lowest course is ruder than the rest. The masonry is badly jointed, and set in mud containing a very slight proportion of lime, appearing as small particles. The stones fall generally under two classes—plain-faced, and drafted with boss. In both classes we observe several stones set on end—*i.e.*, having a height much greater than the breadth—a characteristic noticed all over the building. The plain-faced stones are mainly quarry-picked, but one is slightly dressed in diagonal lines, and another prominently chisel-picked. The bossed stones have drafts varying from 2 to 4 inches in width, dressed with a broad chisel, forming horizontal strokes, except on the top drafts, where they are vertical. One stone has no top draft, and on another the drafts are picked diagonally. A fragment of plaster is found on the draft of another stone. The stone at the extreme left in the fourth course from the top shows a draft along the top edge only; this feature is found on another stone in the main wall, and is characteristic of the masonry of a wall found inside the fortress, to be described when the interior is more fully excavated. The bosses vary in regularity, some projecting with straight sides 2 inches. Their faces are scabelled or pock-marked. The last stone to the left in the top course is flush-drafted, or vermiculated. In the stone to the extreme left in the third course, counting from the top, the upper strip has been left rough, and the rest dressed by the strokes of a chisel used obliquely, alternately up and down, so as to produce a chevron-like pattern. Two similar stones were found in Towers II and III respectively; the latter, however, was so placed that the undressed strip was vertical. On the northern face of Tower IV is a stone with bossed face, showing a revet or reveal on the inner end. As in the present position of the stone this can have served no purpose, we must infer that its present use is secondary.

The tools used in the dressing of this piece of walling seem to be the ones employed in the rest of the building, and are: a broad chisel, a narrow chisel, and a sharp-pointed pick. No signs of the comb-pick (so generally characteristic in Palestine) are found anywhere, but in some cases the broad chisel appears to have been held sideways, so as to make saw-tooth marks. The bossed stones of the Zakarîya Tower are not unlike the specimens shown on pages 117 and 118 of my "Excavations at Jerusalem," found on the scarp to the west of the Old Pool. This scarp represents the line of city wall at the time of Herod, and the masonry may date as far back as that time (pp. 326, 335).

The walls of the fortress were found, in the portions excavated to the rock, to stand to a height ranging from 13 to 19 feet, but the question now arises: How much of the *débris* of Tell Zakarîya had accumulated when this fortress was built? We stated in the last report that this *débris*, averaging about 16 feet deep, was shown by the pottery to consist of three strata: (1) An Archaic stratum on the rock, slightly disturbed in pre-Roman times; (2) a stratum much disturbed in pre-Roman times, but probably after the Archaic period; and (3) a stratum disturbed in Roman times. The depth of the two lowest strata, taken together, averages about 9 feet, and the depth of the third, or upper stratum, about 7 feet. The chief indications of the ground-levels of the fortress interior are given by the sills of the doorways entering Towers III and IV. The sill of the latter is about 7 feet under the surface and is 9 feet above the rock. The sill of the former is about 3 feet higher, showing that the interior of the building had not the same level at all points. From the elevation of the outside face of the south-west side of Tower IV[1] it is clear that the ground-line outside the building must have been at least 5 feet 6 inches above the rock, as we have rude rubble to that height, which is about 3 feet below the level of the door-sill, but the lowest course of dressed stones appears to be rougher, and may have been always underground; at any rate the ground-level outside the building would naturally be lower than the ground-level within. Another indication of level is given by

[1] Plate 2.

the offset between Towers II and III, about 7 feet under the surface, and about 13 feet above the rock. Below this offset the masonry is rubble, and above it, in two different courses, are two well-squared stones, one plain faced and the other flush-drafted or vermiculated. The offset at Tower I is 4 feet 6 inches below the surface and 14 feet from the rock.

From these various indications it is clear that a considerable amount of *débris* had accumulated on the Tell before the fortress was built. It would be rash to dogmatise as to the exact amount, but the key may be furnished by the door-sill at Tower IV, which is nearest in position to the large clearance within the building, and which has the same archæological level (*i.e.*, the same level above the rock) with the top of the second stratum. Accordingly it would appear that the foundations of the building had been sunk in the older *débris* forming the two lower strata, and that the third stratum had accumulated after the building had been erected. This view appears to find confirmation in the fact that large fallen stones were found in that part of the large clearance-pit within the fortress which was near the main west wall, to a depth of 7 feet only, *i.e.*, in the upper stratum. Hence these stones may be due to the destruction of the building. Now, as it is only in the upper stratum that we find Roman pottery, we infer that the building was erected in pre-Roman times. Moreover, the proportion of Roman ware to Jewish and Archaic types is so small, only 2 or 3 per cent., that were there no indications of ground-levels at all, I should not feel justified in ascribing to the Romans the erection of this important fortress, which, from the indications of repair, to be detailed in a further report, was evidently in use for a long period. If the identification with Azekah or Gath be correct, the erection of this fortress may be the work of Rehoboam (2 Chron. xi, 9).

No cross-walls inside the fortress were found running from the main north wall, or from the west wall, between Towers III and IV. However, a cross-wall was discovered blocking the entrance to Tower IV (and hence representing a period later than the construction of that tower), having a breadth of 4 feet 3 inches. Between this and Tower V four other cross-walls appear, varying in breadth from 2 feet 7 inches to 3 feet

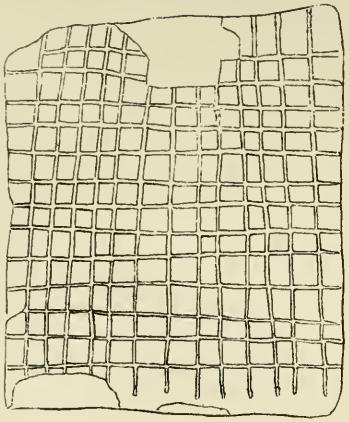
9 inches. None of these five walls are bonded into the main wall, and all are founded on *débris* except the southernmost one, which, as it rests on the rock, is the only one drawn in the present plan. The rest will be noted when we have completed the excavation of other walls in the centre of the enclosure.

The two reports thus far presented have covered only a small portion of the work done at Tell Zakarîya. It would be unedifying to attempt a description of the results obtained in the large clearance within the fortress until that is complete. Our plan, as stated before, was to examine an area, 80 feet square, to the rock, which has an average depth of about 16 feet. This was divided into four sections, each 80 feet by 20 feet; when the first section was completed and all the constructions planned and levelled, we had, of course, a huge pit, on one side of which we were obliged to build a stout, dry, stone wall, to retain the earth thrown back from the second clearance, also 80 feet by 20 feet. In the same way a third section was worked, and a fourth (bounded in part by the east wall of the fortress) has been already deepened for 10 or 12 feet. In the first and second sections we found many walls, tanks, cisterns, vats, pit-ovens, &c., &c., but the third section contained hardly anything but *débris*. On our return we hope to complete the excavation of the area laid out (which is a little over one-fourth of the area enclosed by the fortress walls), and then perhaps to extend it so as to cover twice the area already excavated. The plan of the remains unearthed will give a fair idea of what the building contained. Thus far we gather that it was simply a fortified enclosure containing isolated dwellings.

As to the identification of Tell Zakarîya with the Azekah of Scripture (referred to in Mr. Macalister's article in the January *Quarterly*), I would add that this is the view supported by the "Names and Places" of Mr. Armstrong. It appears to have been originally suggested by the Rabbi Schwarz in his work, "A Descriptive Geography and Brief Historical Sketch of Palestine" (Leeser's Translation, p. 102). At the present stage of the excavations it is not desirable to enter into a full discussion of the question.

The objects in stone, bone, iron, bronze, brick, and clay scattered through the *débris* were numerous and interesting.

TELL ZAKARIYA EXCAVATION: DRAUGHT BOARDS



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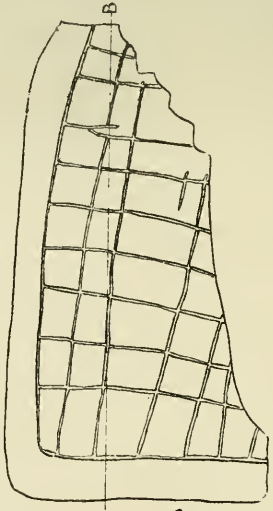

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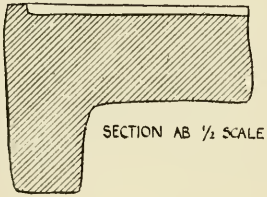

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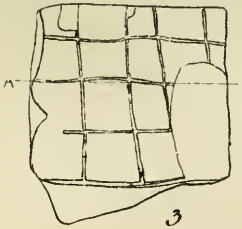

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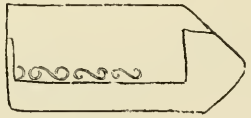

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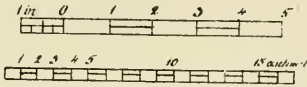


PLATE 3.

PALESTINE EXPLORATION FUND.

Martin, Hood & Clarke, Photolithe, Newport, Salop.

The most important of these have been drawn on 28 plates—obviously too many to appear in a single number of the *Quarterly*, hence we have selected a few for the present number, the rest being reserved for future publication. I shall now run through the objects drawn, describing in detail those now presented and referring in general to the rest.

Stone Objects.—Plate 3 contains three slabs, intended for a game, resembling draught-boards. One is complete, and the other two are fragments only. No. 1 measures 23 centimetres by 20 centimetres by 7 centimetres. The upper surface is flat and contains 13 lines ruled each way, roughly at right angles, forming squares of irregular sizes, the largest being about 1½ centimetres each way. The ends of each of these lines project beyond the last line of the other group, but there are evidently intended to be only 144 squares. The fragment No. 2 belongs to a similar board which apparently had four legs. The crossing lines are even more irregular than in No. 1, and terminate in a raised border. In fragment No. 3 the playing surface is concave, and one side is fitted with a mortice, as though to hold the board in a horizontal position. The surface of this mortice has a faintly-cut ornamental pattern. All three are of soft limestone, and were found in the upper stratum of *débris* at depths varying from 3 to 8 feet. The other stone objects consist of hammer-stones, rubbing-stones, pestles, mortars, discs, coin-rubbers of the Egyptian type, bottle-stoppers, worked flints, &c., &c. Two fragments of alabaster vases, similar to Egyptian ware, were found.

The *Objects in Bone* are not published. There are four specimens, two of them whole, of the polished thin strips of bone, rounded at one end and pointed at another, resembling paper-cutters. These types were found in Cities I and VI at Tell el-Hesy, and also in Jerusalem (*see* Cut 256 in my "Tell el-Hesy," also No. 52, Plate XXVIII, of my "Excavations at Jerusalem, 1894–97"). I have suggested that these may have been used in weaving, for arranging the pattern. Three specimens are drawn of bone prickers or needles, varying from 6 to 8 centimetres in length. These types were very common and were also found at Tell el-Hesy. They have been sharpened

at the point, polished, and perforated through the head. Another bone pricker of a somewhat different type is also figured. There is a bone spindle-wheel, ornamented with crossing lines, and a fragment of a small bone ring, 2·4 centimetres in external diameter, 1·4 centimetres in internal diameter; its small size and flat shape prevent its being regarded as a finger ring, it probably served some ornamental purpose.

Objects in Bronze (Plate 4).—No. 1 is a fragment of a knife. Nos. 2 to 6 are spatulas, all complete except No. 6. The whole ones vary in length from 12·8 centimetres to 16 centimetres. The handles are all cylindrical. Nos. 2, 3, and 6 have flattened triangular heads. Nos. 4 and 5 have flattened heads, inclining to an oval shape. No. 6 is bent and broken off at the handle. No. 7 (an object of uncertain use) is fractured at the ends; the probable restoration is shown in the drawing. It is 8·5 centimetres long, consisting of a thin flat strip of bronze, with T-like projections at either end. No. 8 is incomplete, it is a bronze pin terminating at one end in a flat circular base, slightly wider in diameter than the shaft, and bent with a hook at the other. No. 9 is an ornamental pin bent at the head into a closed spiral. No. 10 is an ornamental pin of another type. No. 11 is a pin or nail with circular head. No. 12 is a pin complete, but much corroded at one part. No. 13 is much bent and broken, probably a fibula of the safety-pin type. No. 14 is a lozenge-shaped arrow-head, the tang broken off. No. 15 is a leaf-shaped arrow-head, the tang is bent and the tip lost. No. 16 is beautifully preserved, except for a very slight fracture at the extreme tip, the tang is formed by bending over the continuation of the edges of the blade. No. 17 is a small ring, the section (not quite circular) is marked on the drawing. No. 18 is a bent thin plate of bronze, perforated with four holes for stringing; it is noticeable that the direction of perforation is not the same, as indicated by the arrows in the section. No. 19, fragment of a small knife, the tang-end broken off. No. 20, a pin, much corroded, the head being broken off. No. 21, pin, much corroded, the upper part seems to be ornamented with horizontal rings, as found in No. 10, but the corrosion makes this uncertain. No. 22, handle of a vessel, consisting of a cylindrical bar of bronze, bent; one end

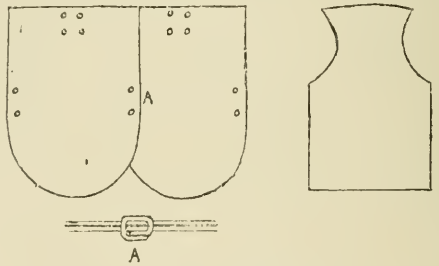
PLATE 4.

Martin, Hood & Larkin, Photolitho, Gt Newport St, W.C.

is hammered flat and curved into a hook, the other end (much corroded) is filed so as to be of less diameter, and then wound into a spiral. The most interesting bronze object is the amphibious figure drawn on Plate 7 (No. 16), to be described on a later page, together with a few bronze objects drawn on the same plate.

The plate of *Iron Objects* is not now published. We have two fragments of knives, one showing two rivets in the tang. There are a number of iron bolts with heads varying in diameter from 2·6 to 3·9 centimetres. In some cases the heads appear to be pentagonal, in others round, but owing to the corroded condition of all it is impossible to be certain on this point. The shafts are square in section. One is complete, being 13·7 centimetres in length; the rest are shorter, but are all broken off. Some are bent, apparently by unskilful hammering. A large number of these nails were found near together at a slight depth. There is a portion of the flat tail of a door-hinge, showing the stump of the hook. It is broken across the nail-hole: present length, 11·8 centimetres; breadth, 3·2 centimetres. A similar object was found to which fragments of wood were adhering, but it was so much corroded that it was not considered worth preserving or drawing. The other objects are: a double-ended chisel, 10 centimetres long, rounded at the ends; two hasps, consisting of bars of iron bent at right angles at both ends; tube of iron, 8·45 centimetres long, bearing a screw-thread on the outside (six revolutions to each centimetre) and formed of two layers of metal, the inner being very thin; and a shaft end of a priming hook, or similar object, showing the recurved blade (broken off just above the angle) and the tube or socket for fitting on a wooden handle, length 10·3 centimetres. The most interesting discovery in iron are the fragments of a cuirass corroded together in a solid mass, found at a depth of about 5 feet. It was necessary to separate these piecemeal, hence, as we found that only a small part of the cuirass remains, it is impossible to restore it completely. Enough, however, remains to establish several points, which are described by Mr. Macalister as follows:—"It was constructed of iron scales (*see* drawing), 5 centimetres long and 3·5 centimetres across.

These are straight-sided, square at the top, and rounded at the bottom, and are slightly bent vertically, so as to be concave to the body. Four holes, arranged in a square, are pierced in the centre of the top of each scale, and two, one above the other, in the middle of each side. Each pair of adjacent scales are lapped so as to make the side holes correspond, and are secured by a U-shaped rivet of bronze, the free ends of which are bent over on the inner surface. By this a series of rings was formed, each of which was then probably sewn on a cloth backing, the sets of four holes at the tops of the scales being intended for the thread. The latter detail, it is hardly necessary to say, cannot be proved directly, as every trace of cloth or thread has long since disappeared, but the absence of any evidence of bronze in the neighbourhood of these holes renders



Detail of Cuirass.

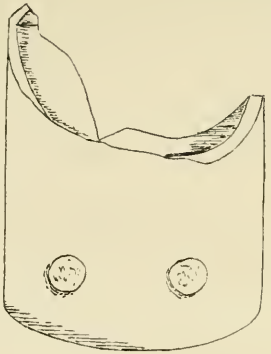
this explanation of their use the most probable. In two fragments the edges of the scales have been turned over so as to prevent them from cutting. These, in all probability, are portions of the collar. From the absence of any scales of greater than normal curvature, we infer that the arms were left unprotected. A few scales of different shape from the rest—rectangular below and invecked at the top—were also found; most probably these are part of the tasses of the lower hem."

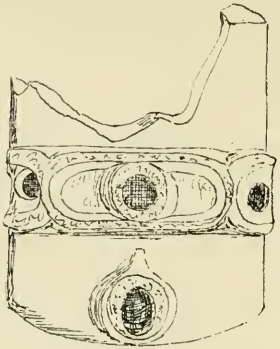
We also found an iron finger ring, wrapped round with thin gold plating. The place for the signet is now a mass of corroded iron; internal diameter, 1·8 centimetres.

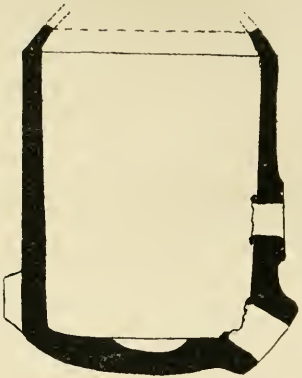
Pottery. — Fragments of pottery were found in great quantities, and a fair number of whole specimens turned up. The types were analysed in the last report. Of the 19 sheets

PLATE 5.

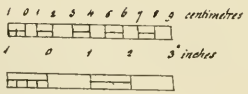
TELL ZAKARÎYA EXCAVATION: PRE-ISRAELITE POTTERY

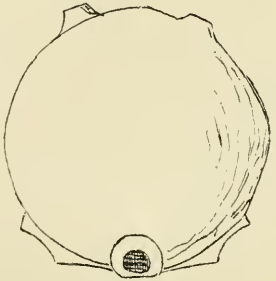






? SMELTING BRAZIER





F. J. Bliss.

R. A. Stewart Macalister

PALESTINE EXPLORATION FUND.

Martin Hood & Larkin, Photolitho, 6 Gt Newport St. W.C.

PLATE 6.

TELL ZAKARIYA EXCAVATION: HUMAN AND ANIMAL FIGURES.

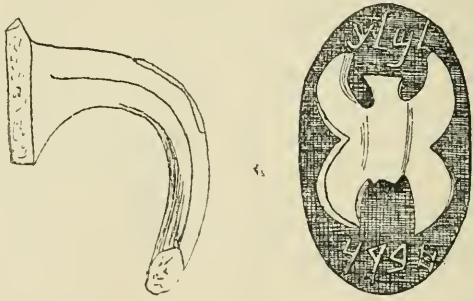
Martin Hood & Larkin, Photolitho, Gt. Newport St. W.

of pottery drawn, eight consist of Archaic (or pre-Israelite) types, only one of which (Plate 5) is published at present. On this plate is figured an object which appears to be a small smelting brazier, consisting of a cylindrical vessel with rounded bottom, broken off at the shoulder near the top. The ornamental band which runs a third of the way around it is perforated with three holes. There is another hole near the bottom. The handle, which was near the bottom on the side opposite to the perforation, is broken off, leaving only the stumps. Three of the sheets are devoted to fragments of roughly-painted ware, showing a great variety of patterns. In the lowest stratum on the rock this Archaic ware occurs almost exclusively, and an immense number of sherds, including some specimens almost whole, were found in a sort of cave, where they appeared to have been thrown. Plate 6 shows fragments of human and animal figures of well-known types. Nos. 1 to 3 are slabs with human figures in relief. No. 1 has the lower half of a female figure; Nos. 2 and 3 show the upper half of female figures, probably Phœnician. In No. 2 the hands are uplifted and hold plants, while in No. 3 the hands are crossed over the breasts. Nos. 4 to 7 are rude heads of the Egyptian type. No. 8 appears to be the head of a bull. No. 9 is the figure of an animal with painted stripes. No. 10 resembles the head of a cat. Nos. 11 and 12 are heads of camels.

In Jewish ware the most interesting finds were:—(1) A group of jars purposely buried in the *débris* outside the east wall of the fortress, in a manner similar to the jar burials at Tell el-Hesy; and (2) a group of 25 small saucers, mostly whole, scattered near each other in the *débris* of the clearance-pit, at a depth of about 7 feet. I am inclined to regard these as late Jewish. One sheet shows a variety of sieves and strainer-spouts, and another illustrates the development of the lamp.

The most valuable find in pottery was the jar-handle of rough, dark-red ware found at a depth of about 6 feet immediately outside of Tower IV. Such handles usually spring from the necks of large jars. On the handle is stamped a cartouche or ellipse, containing a four-winged figure in relief, and two

lines of Phœnician writing, both in relief, one below and the other above the figure. The inscription faces the neck of the jar; in other words, it reads upside down relative to the supposed base of the jar. Both lines are clear, the lower being beautifully sharp, except for the right vertical bar of the first letter, which is somewhat worn, though quite visible. The figure between the two lines of writing appears to represent a creature (eagle ?) with four wings curving inwards, two above and two below; the body terminates above in a wedge-shaped head with no features whatever, and below in a sort of zigzag line between the two wings. The figure has no markings beyond the ordinary roughnesses of the clay. Above the figure are the four letters למלך, and below the figure the four letters חברן, giving למלך חברן for the full inscription. The form of



Stamp on Inscribed Jar Handle.

the second word always appears in the Old Testament as חברון. The absence of the ו (vau) may point to an early date for our inscription. The natural translation is, "Belonging to the King of Hebron," or "Belonging to King Hebron." This jar-handle clearly belongs to the type represented by six jar-handles found by Sir Charles Warren on a bed of rich earth, from 8 to 10 feet in thickness, lying on the rock at the south-east angle of the Haram enclosure at Jerusalem, at a depth of 79 feet from the surface. These jar-handles are described as follows[1]:—

"Each of these handles bears impressed upon it a more or less well-defined figure, resembling in some degree a bird, but believed

[1] "Recovery of Jerusalem," p. 473.

to represent a winged sun or disc, probably the emblem of the sun-god, and possibly of royal power. On each handle Phœnician letters appear above and below the wings, and these in two instances have been interpreted by Dr. S. Birch, of the British Museum, and imply that the vessels were made for the royal use, or at all events in a royally privileged manufactory.

"A. Le MeLeK Ze PHa.—To or of King Zepha.

"B. LeK SHaT.—King Shat.

"C. LeK.—The letters which follow are uncertain.

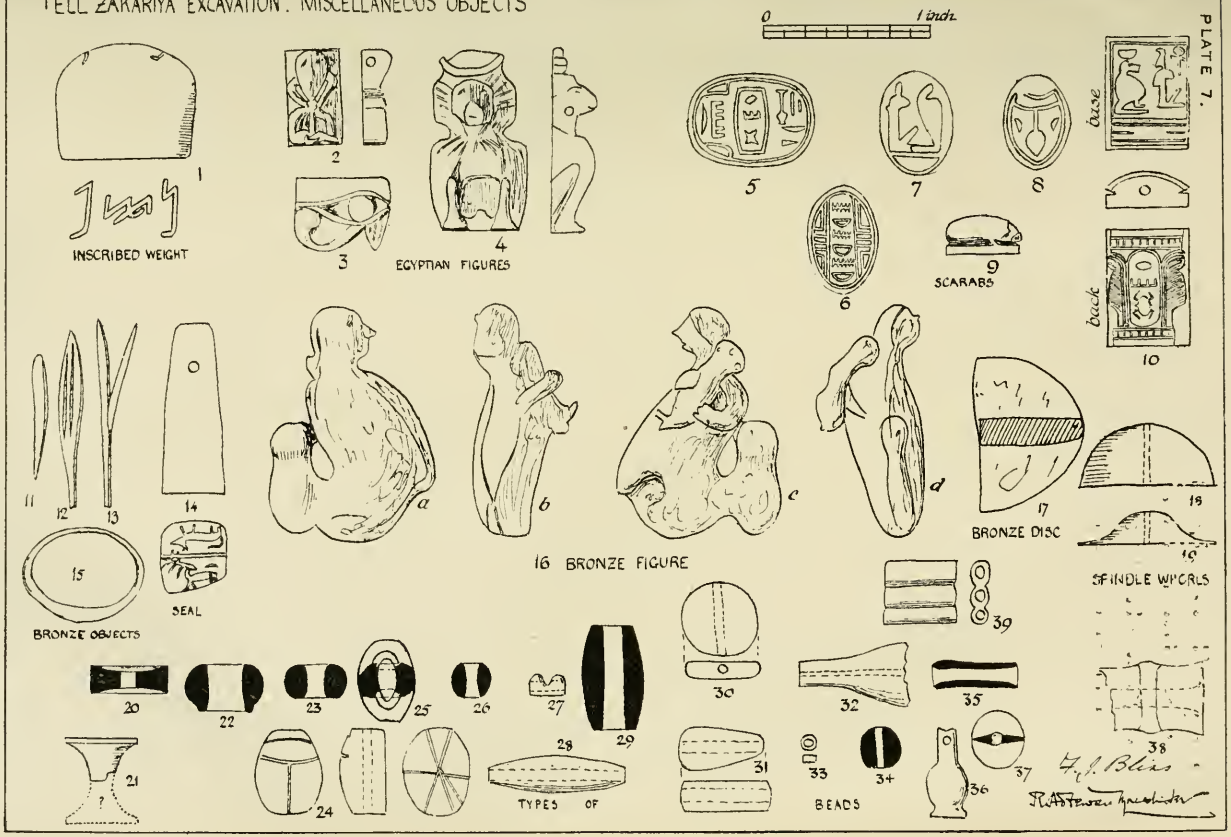
"D, E, F.—The letters are nearly obliterated on these examples.

"It may be hoped that future discoveries may add to our knowledge of the royal personages now for the first time indicated, and that the researches of the Association may be hereafter rewarded by the finding of a fragment of the work of the royal establishment of potters mentioned in 1 Chron. iv, 23, as existing at Jerusalem."

In the specimen figured on p. 474 of "The Recovery of Jerusalem," the inscription will be seen to read sideways with reference to the position of the jar-handle. The four wings of the figure are in the form of an ordinary cross, whereas in the Tell Zakarîya specimen they are placed diagonally with reference to the body of the creature. In describing the Jerusalem specimens it was assumed that Zepha and Shat represented names of persons, not places. From the two cases where Hebron is used as the name of a person (1 Chron. ii, 42 and 43, and vi, 2) we may infer that such a use was common. At the time of the Hebrew conquest, the "Kings" of the so-called royal cities were hardly more than local sheikhs, and perhaps Zepha, Shat, and Hebron were three of these. On the other hand, as Hebron is the name of a place, all three names on the jar-handles may refer to places. The list of royal cities known to us is inclusive merely of those conquered by the Hebrews. Arguing on this supposition we may be able to assign limits to the age of the Tell Zakarîya inscription. In the time of the Patriarchs Hebron was called Kirjath (the city of) Arba (Gen. xxiii, 2; compare also xxxv, 27). The change of name appears to have taken place at the time of the Hebrew

conquest, for it is stated in Josh. xiv, 14, 15: "Hebron therefore became the inheritance of Caleb . . . . and the name of Hebron before (*i.e.*, up to that time?) was Kirjath-arba; which Arba was a great man among the Anakims"; and further, in Josh. xv, 13, 14: "And unto Caleb . . . . he gave . . . . the city of Arba, the father of Anak, which city is Hebron. And Caleb drove thence the three sons of Anak, Sheshai, and Ahiman, and Talmai, the children of Anak." It seems natural to suppose that Arb'a should have remained as the sole name of the place as long as his descendants were in possession. That the older name was not wholly disused is shown by the reference in Neh. xi, 25. The earliest date, then, to be assigned to this jar-handle, according to this view, would be the beginning of the Hebrew conquest, when the new head of the town might have adopted the title "King of Hebron," according to the custom prevailing in the country. The latest date would be the establishment of the kingdom by Saul, after which the term מלך would have a wider sense, and be no longer applicable to a single district. Before David took Jerusalem he reigned seven years in Hebron, but that period is distinctly included in the 40 years during which he is said to have "reigned over Israel" (1 Kings ii, 11), and it is hardly to be supposed that he ever could have been called "King of Hebron."

In my last report I mentioned that we found on the rock "a jar, broken but *in situ*," containing a collection of objects. The jar was not large, having a globular body, but the upper part was quite destroyed. It was standing on the rock, and the fact that many objects were found in it and none in the immediate vicinity proves that it was found *in situ*. The jar contained very fine earth, which appeared to differ from the surrounding soil. The objects, some of which are figured on Plate 7, are as follows:—(*a*) 81 carnelian beads of various shapes: nine of these are in the scarab form, the bases being plain, except that of No. 24, which is marked in the form of a star. Twenty are in bottle form (No. 36), the perforation being on the neck. Other shapes are Nos. 28, 34, and 37. All these shapes are characteristic of Egyptian beads of the late eighteenth and early nineteenth dynasties—1400–1300 B.C.


TELL ZAKARÎYA EXCAVATION: MISCELLANEOUS OBJECTS
PLATE 7.
0 1 inch.
INSCRIBED WEIGHT
EGYPTIAN FIGURES
SCARABS
base
back
BRONZE OBJECTS
SEAL
16 BRONZE FIGURE
BRONZE DISC
SPINDLE WHORLS
TYPES OF
BEADS
H. J. Bliss
PALESTINE EXPLORATION FUND
Martin Hood & Eaton, Photolitho Co Newport Bch. C

(*b*) About 250 beads of enamelled paste and glass—blue, green, yellow, and red; cylindrical, spherical, and shuttle-shaped, with one in the bottle form (Nos. 20, 22, 23, 25–27, 29–32, and 35). No. 39 is of the triple-cylinder shape, and is of blue enamelled paste. (*c*) A collection of minute beads, rounded and flattened, apparently of bone, coloured yellow, brown, black, and green, with some white ones (No. 33). (*d*) A round, black bead; a small red bead, resembling coral; and a bead (No. 38) formed of a resinous substance, now in a somewhat disintegrated condition. It is similar to a bead found at Tell el-Hesy, which was taken at first to be amber, but which turned out later to be identical in material with a specimen in the Geological Museum in Jermyn Street, brought from a resinous deposit near Mount Hermon by Sir Richard Burton. This specimen is not real amber. I regret that I omitted to notice this bead in my book on Tell el-Hesy, for the first examination thereof has led to inferences of an early trade between Palestine and the Baltic which the later examination does not justify. (*e*) A number of small bronze objects, including the following:—1. A small child's finger ring (No. 15). 2. Fragment of a similar ring. 3. A pair of bronzes (?) (No. 13). 4. A pin or small arrow-head (No. 12). 5. A nondescript fragment, perhaps the hinge of a fibula. 6. A small pin (No. 11). 7. A disc of bronze, semicircular in form (No. 17). 8. A broken nail, square in section. (*f*) One small unpolished reddish stone. (*g*) Two polished pebbles. (*h*) Seven spindle-whorls, five of bone (No. 19), two of slate (No. 18). (*i*) A small bone head, perhaps fractured, now in the form of a spindle-whorl, but possibly once of the hour-glass shape (No. 21). (*j*) Three shells, all punctured: one cowrie, one cockle, one murex. (*k*) Four scarabs: one small slate uninscribed scarab (No. 9); one scarab, unidentified, of olive-green enamel (No. 8); bone scarab of Thothmes III (No. 5); green enamel scarab of Amenhotep III (No. 7). (*l*) Four Egyptian emblems: one figure of Bes; one lion-headed figure (No. 4); the eye of Horus (No. 3) of green enamel paste, with sinkings prepared for coloured enamel; a green enamelled figure with all characteristics destroyed.

We may describe here the other objects figured on Plate 7. No. 1 is a small dome-shaped weight of reddish stone, with

flat base inscribed in three Phœnician characters. The first and last letters appear to be כ and פ respectively; the middle letter is slightly worn, but resembles a ז. We thus would read כזפ, though I find no such Hebrew root. The Rev. Père Lagrange, who has examined the inscription, reads כסף, *i.e.*, silver.[1] It weighs about 10 grammes or about 154 grains troy. This suggests the Egyptian *Kat*, which varied at different times and places between 138 and 155 grains (*see* article on Weights and Measures, "Encyclopædia Britannica"). It may, however, belong to a different system. It appears to have no relation to the early Hebrew shekel of 258 grains, or to the late Hebrew shekel of 218 grains. But the Phœnician shekel of 224 grains varied in actual use, being found at Naukratis, in Egypt, as high as 231 grains (*see* as above), and it is noticeable that the Tell Zakarîya weight of about 154 grains approximates to two-thirds of the shekel as found at Naukratis. We infer from Nehemiah's poll-tax (Neh. x, 32) that a third of a shekel existed at Jerusalem. It may be that the Phœnician shekel was divided in the same way. No. 2 is a small figure of Bes of green enamel paste, found in the Archaic stratum, similar to objects relegated in Egypt to the eighteenth dynasty. A drawing of No. 6 was sent to Professor Petrie, who recognises a type certainly earlier than 1700 B.C., and perhaps even earlier than 2000 B.C. It is a scarab of bone. The bone scaraboid (No. 10) bears the cartouche of Thothmes III (contemporary, according to Petrie). It was picked up on the surface of the Tell by the foreman, proving, together with bits of the earliest pottery also found on the top, how disturbed the *débris* is. No. 14 is a small wedged-shaped or sinker-shaped seal of stone, perforated near the top. The design on the base is very faintly incised, and is further much worn. At first we seemed to see a tree, under which were two figures, men or cherubim, but after studying it long in various lights under a powerful lens, Mr. Macalister recognises a horizontal bar, on each side of which is an animal, apparently a stag, the tail curved upwards; the two stags are back to back.

[1] On this subject, *see* remarks in *Quarterly Statement*, 1893, p. 32, by Professor Sayce on the inscriptions on weights brought from Palestine by Dr. Chaplin and Professor T. F. Wright.—ED.

No. 16 shows a small, very rude bronze figure in four positions. The figure is complete, one side (position A), though cracked, is not corroded, hence, though the other side (position C) is somewhat corroded, we may, in studying the figure, take into account all the knobs and projections as representing real features. The object appears to represent an amphibious creature, with the head and body of a man or woman, and the tail of a fish. Position C gives the best idea and shows us a three-quarter figure with the head and tail in profile. The right shoulder is plain, and also the right arm, which is bent at the elbow to support an object (child or animal ?), with its head nestling against the neck of the figure. This object is also clasped by the left arm of the figure, the left shoulder being indistinct. The nose and mouth are fairly plain. The tail curves upwards and joins the back below the shoulder. The upper part of the figure suggests a female form, but the object clasped against the body prevents the breasts from appearing.

This object was shown to M. Levy, of Paris, when visiting Jerusalem, and he suggests that it may represent the goddess Atargatis. Owing to the fact that only a small part of the wide literature on this subject is available here, we confine ourselves at present to a quotation from the article "Atargatis" in the new "Dictionary of the Bible," edited by Dr. Hastings: "In Palestine the principal seat of her worship was at Ashkelon, where she was probably identified with the Heavenly Aphrodite (whose temple is named by Herodotus, i, 105). Another famous shrine of Atargatis was at Hieropolis, or Bambyce (Mabug) on the Euphrates (Lucian, "De Syria Dea," 14; Pliny, "Hist. Nat.," v, 23). At both these shrines sacred fish were kept, and at Ashkelon the goddess herself was represented as a woman with a fish's tail (Lucian, *l.c.; cf.* Ovid, "Melain," iv, 44–46). According to the Greek version of the legend, Atargatis, or Derceto (to use the shorter form of the name more commonly found in Greek), was a maiden inspired by Aphrodite with love for a youth who was worshipping at her shrine. By him Derceto became the mother of a daughter, but, filled with shame, she threw herself into the water at Ashkelon or Hieropolis, whereupon she was changed into a

fish (Diod. Lic., ii, 4). According to Hyginus, "Astron.," ii, 30, she was saved by a fish. The child, who had been exposed, was brought up at the temple of Aphrodite, and became the famous Assyrian Queen, Semiramis." In connection with the mention of a child in the legend, it is interesting to note the object (possibly a child) clasped by the Tell Zakarîya figure. We may also append a paragraph from Perrot and Chipiez's "History of Art in Phœnicia and Cyprus," vol. ii, p. 44: "She appears, perhaps, in one of her secondary forms on the flat of a rock crystal cone in the Paris Cabinet des Medailles. The figure is a very complex one. The bust is entirely that of a woman, and the tail that of a fish, but between the two appear the fore-quarters of a dog." A drawing of this cone is given on p. 44 of the same work. One arm is stretched out with the index finger further extended; the tail does not bend back to the figure as in the Tell Zakarîya bronze, but curves behind in two loops.

My last report was dated December 3rd, and owing to the bad weather we dug for only 12 days between that date and the hour of sunset of December 21st, when the excavations were closed for the season. Rain, of course, was a great obstacle, but a violent wind was almost equally prohibitive. One day the sun shone brightly, but a fierce gale decided me reluctantly to announce that there would be no work. I knew from experience that the clouds of dust from the excavations would almost blind the men, who might overlook and throw away some small inscribed object, perhaps of inestimable value. I have reverted to my plan employed at Tell el-Hesy of giving a small bakhsheesh for every object, however unimportant, which we wish to study. This is Petrie's method, and the only one for ensuring careful search for objects and the preservation of them when found. The smaller the object the greater is the reward in proportion. An eager but quiet crowd of men gather about my tent at sunset, when I note in a book the bakhsheesh assigned. The men are under close supervision, and are instructed to show to Yusif at once any object out of the ordinary, but the attempt is sometimes made to palm off on us objects brought from elsewhere. Detection is almost certain from the nature of the object itself, from the

absence of earth clinging to it, from the cross-examination to which the alleged finder is subjected, from the fact that the men all work together—testimony thus being available, &c., &c. We are very severe in such cases, and I was pleased one day when a man brought me an object which he distinctly declared was not from the Tell. The simplicity of the fellahîn, and their ignorance of the dates of objects, was exhibited by a youth who showed me, as an "antika," a button from my own clothes, which he acknowledged he had picked up from the surface of the Tell. The bakhsheesh paid out at Tell Zakariya has amounted thus far to about £3 3*s.*, and has averaged less than a halfpenny per man per day.

The entire work—only partially covered by these two reports—occupied 39 days, with an average of $51\frac{1}{2}$ men a day. When we remember that the Permit is available till October 1st, 1900, we ought to feel much encouraged, in view of the results obtained already. In describing the labourers I have used the term "men," but towards the close of the work we employed a few women. During the break in the work caused by the weather, the tools have been stored at the village of Zakarîya, and the camp in a house at Ramleh. On my way to the station on December 23rd, I called at the Agricultural School of Beit Jemâl, and the superior expressed regret that we had not availed ourselves of his commodious establishment, promising us every assistance for the future. We stopped the work at just the right moment, for, as Yusif rode with the camp into Ramleh on Christmas Eve, a storm, which had been gathering for several days, broke in fierce torrents of rain.

THROUGH WHICH GATE DID JESUS MAKE HIS TRIUMPHAL ENTRY INTO JERUSALEM?

By Dr. C. Schick.

This question seems to be unnecessary, as literature shows that in nearly every age the eastern gate of the Temple, or the present "Golden Gate," is the one. But as recently a southern gate, generally called the "Double Gate," has been indicated as such under the name "Huldah Gate,"[1] it seems to me expedient to look a little more closely into the matter.

1. *The East Gate, now called "Golden Gate."*

Jesus came from Bethany, situated east of Jerusalem, and 15 furlongs distant from it (John xi, 18). Between is the Kidron Valley and the Mount of Olives, which one coming from there had to cross. There are two principal roads, the direct one going over the top of the Mount, the other, more to the south, somewhat longer, and crossing the ridge where it is much lower. Looking closely to the history, one becomes convinced that Jesus used the direct road over the top of the mountain, for he passed Bethphage, situated on that road or near to it (compare *Quarterly Statement*, 1897, p. 117), and in Luke xix, 37, the "descent" is mentioned, where the city could be seen, which points to the direct way, and so it was taken in all centuries. Coming this way the "Golden Gate," or the former "east gate" of the Temple, is just opposite. Its lintel is 100 feet higher than the point where the various roads are uniting at the present Garden of Gethsemane. And as here, or rather a little more south, the valley coming down from the neighbourhood of Jeremiah's grotto hill through Bezetha falls into the Kidron Valley, bridges crossed both and the line of the road made a curve, the first bridge crossing the Kidron westwards (as at present) to the low rocky shoulder between these two valleys, and the second crossing the other valley in a south-western direction, whence the road ascended the hill in a slope of one in three and a half, or an angle of 16 degrees, up which a donkey could easily go. As the Golden Gate is situated further south than the bridges mentioned, it may be, and most probably was, that a flight of steps went down *direct* into the valley and up again on the other side for people walking and using the southern road over the ridge of Olivet. It has to be remarked that about 50 feet east of the Temple wall the city wall runs at a somewhat lower level than the sill of the Golden Gate, which wall had certainly also a door or gate, but of an inferior kind, with only a single entrance, whereas all the Temple gates had double entrances,

[1] It seems that recently "Huldah Gate" was explained to the German Emperor to be the gate through which Jesus entered six days before Easter, when the people were excited and cried, "Hosanna in the highest." Several members of the Emperor's suite asked me afterwards about it.

as the Golden Gate has to this day. The latter was called in Jewish time "Miphkad" (Neh. iii, 31), and according to the Talmud "Shushan"; whereas the gate in the outer wall was called "Sur" (2 Kings xi, 6). Between this city wall and the Temple wall were houses, forming a kind of suburb. Here riders had to dismount, as it was not lawful to pass the Temple gates riding. At the gates there was always a large free space or square, so when Jesus dismounted from the ass it caused some halting, and the people, who were crying "Hosanna!" pressed more together, so that even the city became aroused (Matt. xxi, 10). Having entered the Temple gate and passed its long vestibule, Jesus went up the flight of steps into the outer court, where, instead of pious, devotional people, he found market business going on, which he cast out (Matt. xxi, 12). There is nothing, either in the locality or in history, against the idea that this gate was the one by which Jesus entered on that solemn occasion.

This is mentioned by the earliest Christian writer, the Bordeaux Pilgrim, A.D. 330, as the "Eastern Gate." And Antoninus, about A.D. 560 to 570, says:—"From Gethsemane we ascended by many steps to the gate of Jerusalem. This is the gate of the city, which adjoins what was once the beautiful gate of the Temple, the threshold and posts of which still stand."[1] Here we have the steps which I have mentioned above, also the city gate in the outer wall, and near it the "Gate of the Temple," or the present Golden Gate, of which at that time stood the lower parts, which, even now, after the restoration, are still recognisable. The restoration of this old Temple gate is generally ascribed to Justinian, but as that emperor died in A.D. 562, and even later, according to Antoninus, as quoted, the gate was still in ruins, it must have been built by one of his followers, between A.D. 560 and 629,[2] at which time it may have stood when Heraclius entered the city with the Holy Cross, on coming back from Persia, though I think the city wall gate probably then still existed and the Golden Gate lay in ruins, and that Heraclius took up the idea to build it again, and in a more monumental manner, as a memorial, first, of Christ's entry on Palm Sunday, and secondly, of his own triumphal entrance when bringing back the Cross of Christ. It then became a proper eastern gate, and the old city gate, with much of the remaining wall, was removed, so as no more to project above the surface of the ground, even as it is to-day, for underground Sir Charles Warren still found the ancient wall ("Recovery of Jerusalem," pp. 156, 157). This work, however, was not finished when eight years afterwards, A.D. 637, Omar took the city, and all building operations were arrested.[3] The openings of this double gate were walled up

[1] Hayter Lewis, "The Holy Places of Jerusalem," London, 1888, p. 91.

[2] "Bædeker" (German edition), 1891, p. 56. It dates most probably from the seventh century after Christ.

[3] This explains the unfinished condition of the building as at present seen.

by Omar, and remained so for some centuries, as neither of the pilgrims speak of it until the Crusaders got possession of the place, A.D. 1102. Saewulf mentions it, and says:—"There is the gate of the city at the eastern part of the *Temple*" (no more in the city wall), "which is called the Golden Gate. . . . . By the same gate the Lord Jesus, coming from Bethany on Palm Sunday, entered the city sitting on an ass, the children singing 'Hosanna to the son of David!' By that same gate the Emperor Heraclius returned triumphant from Persia, with the Cross of our Lord." Every year twice, on Palm Sunday and on the Feast of the Cross, in memory that Heraclius brought the Cross back through this gate, the procession came from the Mount of Olives and through this gate, the Patriarch riding on an ass. Hence it was *open* again, and provided with wooden doors, so that on other days it could be locked.[1] But when the Moslems, in A.D. 1187, again got possession of the Holy City it was walled up again, as it is to-day, and Christians could no more perform their ceremonies there, but had then to enter the city through the Zion Gate.[2] This ceremony was observed until the year 1738, when it was abandoned.

So we see that in all ages this eastern (or Golden) gate was considered to be the gate through which Jesus entered on Palm Sunday; the Huldah Gate is never mentioned.

2. *The Huldah Gate, i.e., the present "Double Gate."*

This gate is situated in the south wall of the Haram es Sherif, or the old Temple wall. It is mentioned by Josephus ("Antiq.," 15, 11, 5) and the Talmud (Middoth, 1, 3), where it is called the "two gates of Huldah." Huldah is the name of the weasel,[3] so some think these gates were called so, because they are like tunnels—people going in at one end and disappearing and coming out at the other, just as these animals do; but others, and the greater part, think the name is derived from the Prophetess Huldah (2 Kings xxii, 14; 2 Chron. xxxiv, 22), that her tomb was in the neighbourhood of the gate, and so the gate was called after her. For the Talmud says that besides the tombs of the kings, also the tomb of Huldah was inside the city, but no other—in what part of the city we do not know. According to the Scripture texts her house was in the "College," as the English Bible gives it, but others translate, in the "second quarter" of the city. The text makes the remark, "in Jerusalem." When this word is used for a certain part of the Holy City in respect to another part, it means the town on the western hill, whereas the part on the eastern hill was the Temple, with its surroundings, and Ophel. So I

[1] Theodorich, A.D. 1172, says that near the Garden of Gethsemane, where the crowds met our Lord with palm branches, there was a high place built up of stones where the Patriarch blessed the palm branches.

[2] *See* Quaresmius and others. (Tobler, "Golgotha," St. Gallen, 1851, p. 448, *f.*)

[3] Levit. xi, 29.

conclude the lodging of the prophetess was on the western and not on the eastern hill, and as most likely she was buried at the place where she had lived, her tomb could be in the neighbourhood of the Temple. This is also clear from the fact that the King had to send a deputation to her to ask her advice. If she had lived at, or very close to, the Temple or king's house, things would have been much simpler. Her house must have been at some considerable distance from the King's house, which latter was close to the Temple; and the double gate (or Huldah Gate) was situated at that time in the King's house itself. Besides all this, the Jews celebrated for a long time the tomb of Huldah on the Mount of Olives, now called Pelagia. All this proves that the tomb of Huldah was after the destruction of Jerusalem by the Chaldæans, and so in the time of the second Temple, no longer known, although the gate in question may have been called Huldah Gate for some reason. But all this has no bearing on the question through what gate did Jesus enter on this solemn occasion? There was no special reason why He should have used this Huldah Gate. Besides this, there are other objections: coming from Bethany, and intending to go into the Temple, the Golden Gate was the very one and not any other. To use the Huldah Gate Jesus had not only to make a very much longer way, but to go down the Valley Kidron as far as the spot where the slope of the Ophel hill was such that a donkey could easily go up. This is in the neighbourhood of the Pool of Siloam, about 100 feet deeper than the ground near the Garden of Gethsemane, and so Jesus would have had to descend 100 feet deeper, and instead of only rising about 100 feet at the Garden of Gethsemane, where the ascent is even easier than at any place on the eastern side of Ophel or the Temple mount, had to rise 200 feet. Besides all this, the idea that Jesus might have used the Huldah Gate is not old but modern. Professor Dr. Sepp is the originator of it, asserting in "Jerusalem und das Pilage Land," Schaffhausen, 1873, vol. i, p. 393, the double or Huldah Gate to be the one the Lord Jesus passed through under the hosanna shouting of Palm Sunday. "For at the Golden Gate the ascent would have been too rugged and bold,[1] whereas at Ophel it was smooth and passing the whole street of the town, where the people became aroused" (Matt. xxi, 10). So he asserts, for the first time, in direct opposition to the tradition that the Huldah Gate was the real one and not the Golden Gate.

The Huldah Gate idea is therefore only 25 years old, whereas the tradition lasted for 1800 years, and will, as is shown above, overcome or outlive the other.

[1] If the Emperor Heraclius could perform the task of entering by the Golden Gate, and afterwards, in the Crusading time, the Patriarch do the same, also riding on an ass, certainly also Jesus could do it, and in a time when Palestine was thoroughly cultivated more than it was in later times after so many disturbances and destructions.

PREPARATIONS MADE BY THE TURKISH AUTHORITIES FOR THE VISIT OF THE GERMAN EMPEROR AND EMPRESS TO THE HOLY LAND IN THE AUTUMN OF 1898.

By Dr. Conrad Schick.

1. At Haifa was made a pier on the seashore for landing at the German Colony, about half a mile west of the city.

2. The road from Haifa to Jaffa was made so that carriages might safely pass; especially the bridges were restored.

3. The carriage road from Jaffa to Jerusalem was repaired, also that from Jerusalem to Bethlehem.

4. From Jerusalem to Jericho the telegraph line was prolonged, so that even from Jericho telegrams could be sent to Europe. As the Emperor did not go there this line was not used at all. One day the wire was cut, and in consequence about 30 people were imprisoned.

5. In Jerusalem, close to the Jaffa Gate, a new and wide entrance into the city was made (*see Quarterly Statement*, January, 1899).

6. In the street going from the Jaffa Gate eastward down to Christian Street, and further on to the three-fold Sook (or Market), the sheds over the fronts of the shops, consisting of all sorts of things, were taken down, so that the street looked wide and open. The walls were whitewashed, and all wooden things painted. So it was done also in Christian Street and other parts. The private houses, and especially the Convents, did the necessary reparations, whitewashings, and paintings. The same was done at the Gate Tower of the Castle, and also at the Barracks there. Many flagstaffs were put up, on which were placed the Turkish and German flags. I send a photograph and description of what was done at the New Erlöserkirche. The city gates were also decorated.

7. Chiefly for the use of the Empress a carriage road was made to the Mount of Olives (*see* Plan). It begins at the Damascus Gate, going northward on the main Nâblus road, but a branch was made from the Imperial Camp, which met the same at the so-called Tombs of the Kings, where it crosses the upper part of the Kidron Valley, here called "Wady el Jōz." The bridge-like dam which is here was made higher, and on the northern slope the new road branches off eastward and goes on a kind of shoulder, comparatively level to the house of the Mufti, where it bends northwards. It crosses the shallow valley by a bridge and then goes in a north-easterly and easterly direction up to the top of the mountain, and on it south-eastwards, and finally southwards to the village et Tûr, so that on the one side there is a prospect from it of the Kidron Valley and Jerusalem, and on the other of the many hilltops and the descents to the Jordan Valley, and beyond them of the mountains

beyond the Jordan. To see the village, the Ascension Chapel, the Russian Ground, Church and Tower, one must walk, and then return by the carriage the same road. For the natives the new road is not of much use, but for the citizens it makes a fine drive, affording good air and fine views. In the field north of the village et Tûr, old foundations of former houses were met with when the road was made, proving that once many more buildings were standing on the top of Mount Olivet than at present.

8. From the Guard-house near the Hospital of the Municipality on the Jaffa road, about one mile west of the city, to the gate, on both sides of the road were put flag posts, about 10 metres distant one from the other, and connected with a kind of garland made of branches of trees ; further were put up posts for lanterns on the one and on the other side of the road, just as it was convenient, and about 75 feet apart. The lamps were burning all night during the Emperor's stay. Such lantern posts were also put along the side road, beginning at the former Austrian Consulate, passing the English Hospital, the German Consulate, the German Hospital, Dr. Schick's house, to the Imperial Camp, and lower down to the main road.

9. Outside the gate of Neby Daûd the road along the city wall was made wider, and the rest made so that one could drive out through the gate of Neby Daûd, and to the place the Emperor took possession of, and if desired return from there to the Jaffa Gate.

10. At Bethlehem a road was made branching off eastward from the Hebron road for driving up to the German Evangelical Church and School, and from the latter through the city down eastward to the Church of the Nativity, for which, in order to get the proper width, a few houses had to be taken down. Further, a new carriage road was made from the German Church southward through the vineyard about one mile long to the new German Orphan Home, built recently, from which a road goes also down to meet the Hebron road.

11. Not only all the German residents of Jerusalem, but many others had their houses decorated and with many flags (so, for instance I had on my house about 15 flags, besides smaller decorations). Even many Moslems had put flags on their houses, and on the night of the day on which the Church was consecrated there was a general illumination with fireworks sent by the Sultan, and let off by a Turkish officer opposite the Emperor's Camp, on the roof of the Rev. A. H. Kelk's house, so that the display could be seen in the whole town and neighbourhood. The fireworks lasted for about two hours.

12. The many beggars were gathered before the arrival of their Majesties and sent by escorts to villages some distance from Jerusalem ; and it seems that even the dogs, which at night make so much noise, were diminished.[1]

[1] Another account which has reached the office of the Fund states that during the Imperial visit " the street dogs were catched and housed in cages ! "

13. At the Haram es Sherif much restoration and oil-painting were done, also many architectural decorations; for instance, the arches over the pillars on the stairs of the platform were plastered over, so that the stones can no more be seen, and then painted fantastically, and so also the front of the Aksa Mosque, which now looks yellow as if gilded and has a very strange appearance. Other things were done with better taste.

A NEWLY DISCOVERED HEBREW AND GREEK INSCRIPTION, RELATING TO THE BOUNDARY OF GEZER.[1]

By Prof. Charles Clermont-Ganneau, LL.D.,
Membre de l'Institut, Professeur au Collège de France.

It is well known that the town of Gezer has played an important part in the history of Palestine. It was already in existence before the Israelites entered the land of Canaan; in fact, the Book of Joshua mentions the Canaanitish King of Gezer as one of those with whom the new conquerors had a quarrel to pick, and the testimony of the Bible on this point has been clearly confirmed by the cuneiform tablets discovered at Tell el-Amarna, as well as by the Egyptian records: amongst others, the *stela* of Merenptah, the date of which is fixed at about the year 1230 B.C. A sacerdotal town under Israelitish dominion, the point of intersection of the boundaries of the territories of Ephraim, Dan, and Judah, a frontier town in the extreme east of the territory of the Philistines, captured and burnt by one of the Pharaohs of Egypt —Gezer had been given by this Pharaoh to his daughter as a dowry when she entered the harem of Solomon, and the ancient city, originally Canaanitish, subsequently Philistine, and finally Jewish, was rebuilt by the Israelitish monarch. During the period of the Maccabees Gezer figures continually in the course of the long struggles carried on by the Jews against the Seleucidæ, and becomes one of the chief bulwarks of the Asmonæan princes. Lastly, considerably later, Gezer—which, as I have already shown,[2]

[1] Read at the Académie des Inscriptions et Belles-lettres, at the meeting of October 28th, 1898.

[2] "Recueil d'Archéologie Orientale," vol. i, pp. 352–391: *Mont Gisart et Tell el-Jezer.*

is nothing but the *Mount Gisart* of the Crusaders, which was so long a topographical enigma—was the scene of a brilliant victory gained by them over Saladin—a victory which at that time was celebrated throughout Christendom, but for which, some few years later, Saladin exacted a terrible revenge in the disaster of Hattin, which destroyed the Latin Kingdom of the Holy Land.

In spite of the ample historical information and topographical indications furnished by ancient authorities, in spite of all the researches of explorers, the problem of the identification and site of this very important town—a problem which contains the key to many others—had remained insoluble up to the year 1871. Gezer could not be discovered.

At this time, thanks to an apparently unimportant passage, buried in an ancient Arabic chronicle, I was led to suggest the identity of the town of Gezer with an ancient *tell* or hill, covered with ruins, and occupying a most remarkable strategical position, which still bears, in addition to the common and misleading name of Abu Shûsheh, its primitive Canaanitish name, faithfully preserved under the Arabic form of Tell el-Jezer.

In 1872 I read before our Society, to which I had not at that time the honour to belong, a paper, the object of which was to show that this *tell*, which did not appear upon any map, and which I had succeeded in discovering on the site, answered to all the historical, topographical, and toponymical data of the problem.

When I had finished reading this paper, our regretted fellow-member, M. Miller, who presided at the meeting, while addressing to the author of the communication the few kind words that are customary on such occasions, thought it his duty to express certain reservations in regard to the value of the arguments which served as the basis of a proof which appeared to him to be somewhat venturesome.

I can even now call to mind the little touch of irony, although courteously worded, with which the learned Hellenist, making himself the interpreter of the scepticism exhibited in the observations of certain of his fellow members, added that it was to be regretted that I could not produce in support of a thesis, which was rather a hypothesis, the aid of some sound epigraphical argument—for instance, an inscription *in situ* containing the name of the town in dispute. This was, perhaps, a great deal to

demand from poor Palestine, which has always shown itself so chary of proofs of this kind. I was therefore obliged to confess, with all humility, that I had only been able to work upon the precarious elements that constitute the foundation of the purely inductive method, to which, alas! all those who study the topography of the Bible are condemned. At that moment I had no idea that, two years later, I should have the unexpected good luck to be enabled to give a complete answer to this request, which perhaps brought me good fortune, and to discover, on the very site which I had assigned to Gezer, not *one* inscription, but *a series* of decisive inscriptions, which at once justifies, specifically, my theoretical views and, what is perhaps even more important, the general method which had guided them and the value of which had been so seriously called in question.

In fact, in 1874, having had the opportunity of revisiting the spot in the course of the mission with which I had been entrusted by the Palestine Exploration Fund, I discovered, carved upon the rock about 800 *metres* to the direct east of Tell el-Jezer, a bilingual inscription, in large Greek and Hebrew characters, containing these simple words, singularly significant in their brevity: Ἀλκίου, תחם גזר, "boundary of Gezer, of Alkios." This Greek, or rather Jewish-Greek, name Alkios in the genitive case, is probably that of the civil or religious magistrate who had presided at the settlement of this official boundary about the time of the Maccabees—to judge from the palæography of the characters. The identity of Gezer and Tell el-Jezer was accordingly established, this time in such a manner as to satisfy the most exacting criticism.

Struck by the fact that this epigraphical landmark was normally oriented in reference to the *tell*, I concluded that the boundary in question must be a boundary surrounding the city, and not simply a line of demarcation, passing, for instance, between two contiguous territories; in the latter case, in fact, we should expect to find the second territory mentioned: "Boundary of Gezer and . . . ." Remembering that Gezer had been a Levitical city, I was led to suppose that we might have to do with the delimitation of the sacred zone, the *migrash* that surrounded the Levitical cities, a zone which in many respects recalls the προάστειον or *pomerium* of classical antiquity, and which seems later to have served to fix the legal distance of

the well-known "Sabbath day's journey" (σαββάτου ὁδός. תחום שבת), mentioned in the Acts of the Apostles and the Talmud. Starting from this idea, I drew the inference that this epigraphical landmark could not be isolated, and that a whole series of others should certainly be discovered round the site of Gezer, at perceptibly equal distances and at points distributed according to normally oriented lines. The Bible, in fact, tells us that the sides of the *migrash* were oriented according to the cardinal points.

This reasoning was soon justified by the result. Prosecuting my search along a line drawn by the compass from S.E. to N.W., I soon discovered, at a distance of about 150 *metres* from the first inscription, a second, carved like the first upon the rock, and absolutely identical in purport: "Boundary of Gezer, of Alkios." The only difference is that in this case the two texts were arranged back to back, instead of being put end to end as in the first case. Further, between these two inscriptions I discovered a third, purely Hebrew, shorter, and difficult of interpretation.

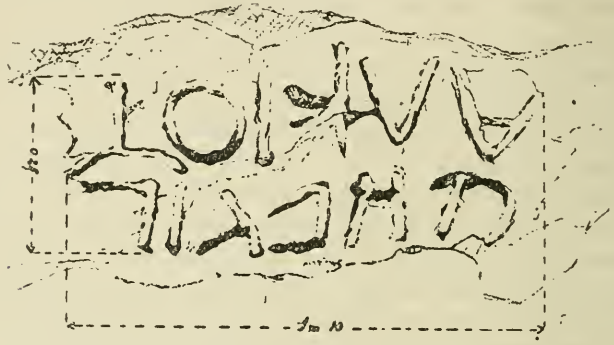
I immediately had these precious documents excised in order to protect them from the chances of destruction which they had hitherto miraculously escaped. Unfortunately a conflict with the local authorities, stirred up by the treachery of certain Europeans settled in the Holy Land whom I had been foolish to trust, abruptly cut short my researches in the neighbourhood of Gezer. It was not until seven years later, when I revisited Palestine in 1881, that I was able to resume them, and then only incompletely. On again passing the site of Gezer I discovered, still in the same direction, S.E. to N.W., a third copy of the bilingual inscription of the boundary of Gezer. This time, the two texts, still identical and carved in large letters upon the rock, were superposed.

Meanwhile, having been suddenly called back to France, I was unable to carry out my plan of thoroughly exploring the environs of Gezer in order to find the other similar epigraphical landmarks, which, in my opinion, were bound to exist upon the other sides (north, west, and south) of the *migrash*. When publishing, in the second volume of my "Archæological Researches in Palestine,"[1] my complete examination of the question of Gezer, I earnestly brought this desideratum to the notice of future explorers.

My appeal has been heard. Père Lagrange, whose learning and activity our Society has frequently had occasion to appreciate,

[1] London, 1893, pp. 224–265.

informs me that, with the assistance of the Fellâhîn of the district, whom I had formerly directed to follow this track, he had just discovered a *fourth* copy of the boundary inscription, carved upon the rock, and to the same effect. Here is the rough copy which he has been good enough to send me, which was taken by Père Delau :—



תחם גזר 'Αλκίου
(Hebrew) Limit of Gezer. (Greek) of Alkios.

It will be observed that the arrangement of the two texts is identical with that of my copy, C, that is to say, that the Hebrew and Greek lines are back to back. The inscription as a whole is 1·10 *metres* long by 0·25 (?) *metre* high.[1]

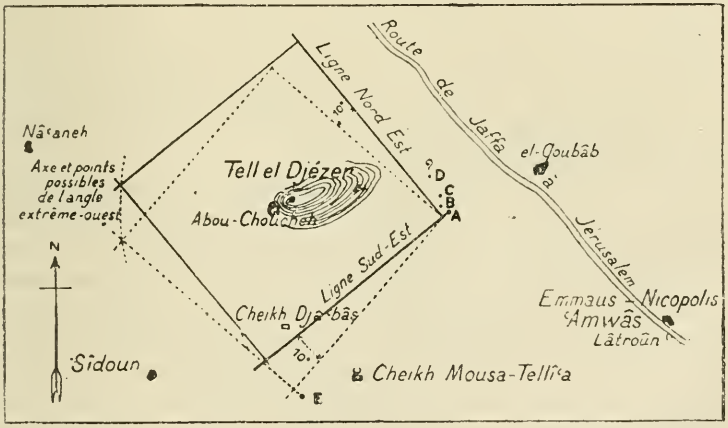
The discovery of this fresh text, confirmatory of the preceding ones, is in itself very interesting. But what is of special importance is the position which the text occupies in reference to Tell el-Jezer and other congeneric texts. It is, in fact, situated *due south* of the *tell*, and consequently in quite a different quarter from the first group of inscriptions situated on the east; this tends to prove, as I had previously supposed, that the intended boundary is really a line limiting a zone that surrounded the town.

The question, which I have examined at length elsewhere, is: What was the form of this zone, was this limited area a circle or a square? The south-east north-west direction of the four first inscriptions discovered by me (A, C, D, and, by way of

[1] On the other hand, Père Delau says in a note that the average height of the letters is 0·20 *metre*, which it is not easy to reconcile with 0·25 *metre* as the total height of the two lines. Besides, in another more compendious sketch, two superposed figures are given, 0·25 + 0·17, or a total height of 0·42 *metre*, which is more probable.

support, B), compared with the description of the *migrash* of the Levitical cities as given in the Bible, had led me to think that this area might be a square, comparable in certain respects with the square area of the *ager publicus* of the Roman cities and colonies, with its two chief lines of direction, the *cardo maximus* (north to south) and the *decumanus maximus* (east to west), intersecting at a right angle, and with its *extremitates* marked by the *termini territoriales*.

On the other hand, the distribution of these inscriptions along an oblique line proceeding from east to north seemed to indicate that this square was set towards the four cardinal points, not by its sides, as might *a priori* appear natural (and as is the case with the Roman *ager publicus*), but by its angles. Père Vincent, taking into consideration these various items of information with which I had furnished him, drew up the little topographical diagram below, which is intended to show the relative position of the recently discovered text.



A. C. Bilingual inscriptions of the boundary of Gezer, discovered in 1874, by M. Clermont-Ganneau.
D. Bilingual inscription of the boundary of Gezer, discovered in 1881, by M. Clermont-Ganneau.
B. Hebrew inscription of the boundary of Gezer, discovered in 1874, by M. Clermont-Ganneau.
E. New bilingual inscription, discovered in 1898.

This position is still only approximate. It would be of great importance to fix the point with great exactness, by mensuration and triangulation. The square in thick lines, which is based

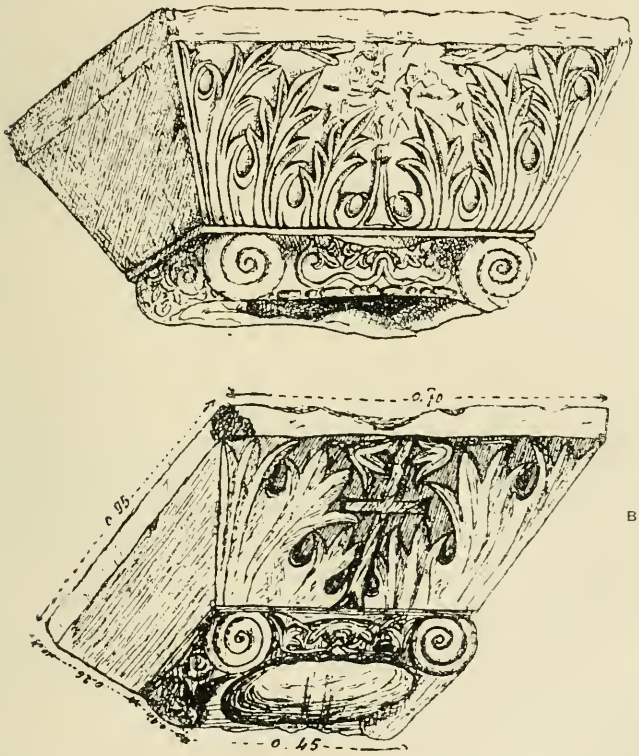
upon the inscription A, considered as the extreme eastern landmark, represents the theoretical square, accurately arranged in accordance with the plans of the Ordnance Survey.

The square in dotted lines represents that constructed on the right, joining the two inscriptions, A E, and hypothetically regarded as its south-east side; it apparently exhibits a deviation of about 10 degrees, with true orientations—a deviation which would be by no means excessive, especially if, as is possible, the ancient orientation was fixed by one of the solstitial points, not by the equinoctial point.

Until we are better informed, the new fact introduced into this particular problem, which is of special interest for Biblical exegesis, is not unfavourable to the theory of a square area, set by its angles. But the problem can only be finally solved by a complete and rigorously accurate survey of the ground, showing the mathematical position of the points indicated by the inscriptions. It is the more earnestly to be desired that this work should be undertaken, as it would doubtless bring about fresh epigraphical discoveries of the same kind. I will therefore permit myself to express the wish that the *Académie* will entrust the task to Père Lagrange, who is so admirably fitted to undertake it, and at the same time place at his disposal the means necessary to accomplish it.

I will add, but without insisting for the present upon a scheme which I do not conceal from myself presents difficulties of every kind, that the *tell* of Gezer itself would certainly seem to be one of the most likely spots in Palestine for methodical excavations. Digging could be carried on there with assurance of successful results, thanks to the certainty, unique of its kind, that we possess relative to the identity of the site. Everything there would be of interest, from the layer of the Crusades that covers the surface, to the deep layers in which are hidden the remains of a past anterior to the Exodus. Why should we attack, as is too frequently done, somewhat at haphazard, *tells* that are anonymous or of doubtful origin, and neglect this particular one (as has hitherto been the case), when it possesses the inestimable advantage of having a name that is known, a personality that is ascertained, and a continuous history of its own, intimately connected with the general history of Palestine from the most distant times to the era of the Crusades?

While exploring the environs of Gezer, Père Lagrange and his companions observed in the little *wely* of Sheikh Mûsa (*Mûsa Talî'a*), not far to the south of Gezer, beyond Sheikh Ja'bās, a curious capital in white marble with thick veins. The annexed sketches, which Père Vincent made with great care, and the little note which accompanies them, relieve me from the necessity of further description.



Order very composite. The large faces are bare, with the exception of the volutes. The face, A, is of finer workmanship than B, in which the arrangement of the acanthuses is irregular. The cross has been partly hammered.

I had already seen this capital in 1874, and had been struck by its curious form. I had greatly regretted that the circumstances to which I have alluded above, and which had abruptly put an end to my researches in this district, had prevented me

from making a drawing of it. Thanks to Père Vincent, this want is now supplied.

On this subject I may be allowed to quote the few lines following, from vol. ii of my "Archæological Researches in Palestine" (p. 236) :—

"Further on, and to the south-east, on the top of a hill, rises the sanctuary of Mûsa Talî'a, or *esh Sheîkh Mûsâ Talî'a*. It consists of a small *kubbeh* of rough masonry work, with a court in front of it; the tomb is original. Close by is a large cistern, with its mouth fashioned out of a fine marble capital, carved on two sides. I regret that I did not make a drawing of this. I found no trace of the inscription which I had been told the previous June was to be found there, but it does not follow that it is not really there. The holy person answering to the name of Mûsa was placed there, so the fellâhîn say, as a 'scout' (*talî'a*), to 'observe' (طلع) the movements of the Christians, who were fighting with the Musulmans in the Wâd es Serâr. The Christians surprised him at his post and killed him; he died the death of the martyrs (*Shehîd*). It is a fact that the spot is situated on a commanding point, whence there is a very fine and extensive view. The three points, Tell el-Jezer, Sheîkh Ja'bâs, and Sheîkh Mûsa, are similarly situated in this respect; accordingly the fellâhîn call them *Mûsa Talî'a*, *Ja'bâs Talî'a*, and *Jezery Talî'a*, making these three more or less real personages into three warriors of old, placed as scouts on the three places that command the region round about. I am greatly inclined to believe that there is a hidden historical basis to the legend of Mûsa Talî'a, some incident of the great battle of Mount Gisart, between Saladin and the Franks, and that Mount Gisart, the site of which has remained absolutely unknown up to the present time, was, as I shall explain later on, none other than our Tell el-Jezer."

On seeing again, after an interval of more than twenty-four years, the faithful representation of this capital, I ask myself now whether this last impression was not correct. May not the presence of the cross (of the form called Latin) on the two faces of the capital indicate a work of the Crusaders, although certainly the acanthus leaves and the bastard volutes rather lead us to think of a Byzantine work, and this particular form of the cross is by no means unknown to Byzantine art? To answer this question with any degree of precision, it would be necessary to re-examine

the monument closely, and ascertain whether, in any of its parts, it happens to present the characteristic diagonal *striæ* of the Crusaders' stone dressing. In this case we should be justified in supposing that the capital may come from some church dedicated to St. Catherine of Mount Gisart, the existence of which I have already deduced from the fact that the great battle won by the Crusaders over Saladin at this spot was fought on St. Catherine's Day.[1]

Be it understood that it is only with considerable reserve that I venture this hypothesis relative to the origin of the capital. I will only observe that in its general form, if not in its ornamentation, it offers a certain analogy with three marble capitals, also quadrangular, discovered by me in 1881 in the same neighbourhood, at Ni'âneh, a little village not far to the east of Tell el-Jezer.[2]

THE RUINS OF THE HERODIAN JERICHO.

By the Rev. J. E. Hanauer.

When down at Jericho recently I rode over with the Rev. Dr. Nies to examine the remains at Khirbet es Sumra, on the northern bank of Wad en Nûei'ameh. I am convinced that this was the site of Herod's Jericho. The remains are most extensive, but are being destroyed rapidly by searchers for building stones. We noticed debased Roman capitals, bits of spirally-fluted column shafts, and a great many Roman fire-tiles belonging to baths. Also indications of two or three well-built circular or oval chambers connected with the baths, and perhaps marking either the position of boilers or laconica and sudatories.

I know that Dr. Bliss gave a general plan of these ruins in the *Quarterly Statement* (1894, p. 175) some years ago, but a more detailed plan, and an attempt at restoration and comparison with other plans of

[1] *See*, on this question, the chapter in vol. i of my "Recueil d'Archéologie Orientale," quoted above.

[2] I deposited the originals in the Louvre and have given reproductions of them in my "Rapports sur une Mission en Palestine et en Phénicie entreprise en 1881," pp. 63, 64, Nos. 17, 18, 19. No. 17 bears, inscribed on a crown, the well-known formula, ΕΙC ΘΕΟC (one God), which is also found again upon the famous bilingual capital of Emmaus, in Greek and Hebrew-Samaritan. The acanthus leaf of No. 18 somewhat resembles those of the capital of Mûsa Talî'a.

Roman baths, might be valuable and interesting, but this is work which needs a fully competent engineer and architect. I myself am fully convinced that the mounds at 'Ain es Sultan represent the ancient Jericho of the Canaanites, whilst the Khirbet es Sumra remains, and the bath, fed by an aqueduct from 'Ain es Sultan, mark the palaces and city built by Herod, "higher up the valley," and called by him Phasaelis (Josephus, "Wars," I, 21, § 9, as quoted in Smith's "Bible Dictionary").

The plain between the two great ruin-fields is strewn with stones, and, as we rode across it, we every now and then came upon indications of house foundations flush with the ground, and marking probably the dwellings of the poorer people. The walls have quite disappeared, but in several places we could clearly trace the plans of several sets of rooms.

A mosaic pavement, marking the site probably of a church or chapel, has been found within the enclosure of the half-way Khan of the Good Samaritan on the way to Jerusalem; and in the caves close by the Rev. A. H. Kelk and I noticed some artificially-cut small niches, showing that a columbarium, belonging to the garrison of the old fort on the hill-top, had once been here.

NOTE ON GIBEON, NOB, BEZEK, AND THE HIGH-LEVEL AQUEDUCT TO JERUSALEM.

By the Rev. Andrew J. Gregg.

Gibeon is mentioned in Ezra (ii, 20) and in Nehemiah (vii, 25, &c.); in one called Gibeon, in the other Gibbar. Gibeon, then, was not the only name by which it was called. In every instance in which Gibeon is mentioned, Nob is not; and where Nob is mentioned, Gibeon is not. Gibeon was one of the cities given to the priests out of the tribe of Benjamin; and not only so, but by special treaty with Joshua the inhabitants of Gibeon were made hewers of wood and drawers of water for the house of the Lord.

Saul slew the Gibeonites in his zeal for the children of Israel, but of this slaughter no mention is made in the history of Saul under the name of Gibeon. Mention is made of his smiting the "city of the priests" with the sword, after Doeg the Edomite had slain the 85 priests. No mention is made of the removal of the tabernacle and of the altar from Shiloh to Gibeon. They were in Shiloh in the time of Eli, and in Gibeon when Solomon sacrificed there; the removal, then, must have been a special matter with the priesthood, perhaps under Zadoc, when Shiloh was discarded.

A passage in Isaiah (x, 32), where mention is made of Nob in describing the approach of the Assyrians, is quoted, as intimating that Nob was within sight of Jerusalem, but it was the inhabitants of Gebim

fleeing from Jerusalem on the Assyrians' approach, and staying that day at Nob, on their way home north, who shook an angry hand against the daughter of Jerusalem, the stronghold of Zion. Gibeon and Nob were, I think, the same place.

2. *Bezek* means lightning, and is not the name of any place. Adonibezek adopted the affix in ridicule, discarding his predecessor's name of Adonizedec, which name was a variation of Melchizedek, the original King of Salem, implying the inferiority of the Jebusite king to the royal priest of the Most High God. The word bezek is used to express the rapid promptness with which the children of Judah and Simeon found Adonibezec when going to take possession of their lot. It is a play upon the word, of which there are other instances in the prophet Micah. The word is used also in describing the hurried numbering of the people by Saul, when about to start for the relief of the siege of Jabesh Gilead.

A Beersheba in the neighbourhood of Bethel and Gilgal is mentioned twice in the prophet Amos (v, 5; viii, 14); this was the Beersheba where Samuel's sons were judges, and is likely the same as Beeroth, which, from its position, is a very probable place to have been their seat of judgment, situated as it is between Ramah and Bethel and in an elevated, prominent position.[1]

3. *The high-level aqueduct*, from the upper Pool of Solomon to Jerusalem, ranks with Herod's great works; and the fact of Herod's conveying water by aqueduct is certain, for that to the Frank Mountain must have been his.

As long as the inverted syphon of the Jerusalem aqueduct could be kept from leaking and from being choked in the bottom with deposit from the water, the constant flow would compensate for the continual draw upon the cisterns on the Temple Hill, made by a service of water-carriers to supply Herod's ponds; Josephus mentions a gate through which water was brought into Herod's palace.

The reservoir discovered at the Latin School, near the new gate, was high enough to give considerable force to the water for the fountains.

The engineers of Pilate's aqueduct chose a line of country which afforded a continual fall for the water all the way.

I think the high-level aqueduct is to be credited to Herod, and that it was abandoned on account of the difficulty, or perhaps practical impossibility, of keeping the huge inverted syphon in working order.

[1] On this subject see a note by Dr. Schick in *Quarterly Statement*, 1898, p. 17.—[Ed.]

THE TOMB NEAR THE SKULL HILL, JERUSALEM.

By Miss C. Hussey.

In the *Quarterly Statement* for October last Mr. Tenz makes some statements about the tomb near the "Skull Hill," in Jerusalem, "believed," as he says, "by some to be the Tomb of Christ." Allow me to make a few comments on the subject.

In the first place, he states that when the tomb "was first discovered . . . . it was full of bones and earth, and when cleared out the mark of a cross was found on the east rock-wall, and another on the north side . . . . no doubt dating from crusading times."

This is correct, but he probably did not know that the lower stratum of earth was quite free from bones, or any trace of corpses having been deposited there for a depth of 2 feet or more. The bones, which were thrown loosely on the top, may have been from crusading times, but the crosses were certainly Greek, with Greek letters in the corners. It was a very common practice for Christians to use any rock tomb they found, and paint or scratch a cross on it at the same time. Crosses are found on tombs of all shapes, sizes, and dates. Anyone who has studied the tombs in this land will be aware that they were used again and again, and that the date of any bones or relics found in a tomb is no indication of the time at which the tomb was originally hewn. I have myself found Cufic, Byzantine, and Herodian coins, some Roman glass, and a small clay image of Ashtaroth in one very old tomb, besides some bones which could not have been more than 100 years old.

There are many traces of buildings and cisterns close to the Garden Tomb, but as the former are all of later date than the Herodian period, that is no proof that it was not a garden in our Lord's time. One of the cisterns may have existed then, but a cistern in a garden is very usual. This one is some distance from the tomb.

One building, probably Byzantine, has certainly been erected against the face of the rock in which the tomb was hewn, and the rock levelled to form its floor. Enough of this has not been uncovered to show the shape or extent of the building.

Close to the door of the tomb there is, as Mr. Tenz says, "a long trough cut in the solid rock, which appears to have been used as a drinking-place for cattle." This "trough" is a groove, 26 feet long at present, but broken away at each end, so that it may have been longer. It is *exactly* the same width as the groove for the rolling stone in the so-called "Tombs of the Kings" (supposed to date from the first century B.C.), and the only reason I see for doubting that it was made at the same time as the tomb and intended for the stone which was to close it, is that the tool marks in the groove and on its side are different to those on the inside and outside of the tomb, and appear to me to be newer.

Mr. Tenz states that "the entrance to the tomb is more than 2 feet higher than the ancient level of the rock floor outside, so that the disciples would not have required to stoop down to look in." I should be much interested to learn how Mr. Tenz has ascertained the ancient level of the rock. Since it has been smoothed to form the floor of the Byzantine building it is not quite 2 feet below the floor of the tomb, and it would have been difficult, I fancy, to level the rock without lowering it in some parts. Whether the groove or "trough" was cut at the same time as the tomb or later, we may conclude that the rock near it was originally at least as high or higher than its outer edge. I should, however, much like to know why St. John must necessarily have walked on bare rock, swept clear of earth, stones, or rubbish. I should fancy that as the tomb was newly made, and possibly unfinished, there would probably be a pile of broken stones and chips outside; and if it were a garden surely there would be a layer of earth there.

As for the present doorway, anyone who examines it carefully will see that it was first made small and afterwards enlarged. Mr. Tenz in his remarks seems to divide the rock tombs of Palestine into late Jewish, *i.e.*, after the Jewish captivity, and Christian, as he says of the tombs in the "Church of the Holy Sepulchre," that "they must have been outside the second or Nehemiah's Wall, as none but David and the Kings of Judah were allowed to be buried within the City of David." I fail to see what connection there is between these two statements, as I believe that the Kings of Judah were all dead and buried some time before Nehemiah's Wall was built.

However, the tombs in that church are undoubtedly of the oldest form of tomb to be found in Palestine, and I should certainly be inclined to date them not merely from before David's time but before the invasion of Palestine under Joshua. I think nearly if not quite all the tombs hewn as caves are either Canaanite or Israelite work originally. I do not know of any which have certainly been hewn out since the destruction of Jerusalem under Titus, but I know of several which have been altered by Christians, and, as I remarked before, they generally have a cross scratched, painted, or carved on them. Even supposing the so-called tombs of Nicodemus and Joseph to have been early Jewish (*i.e.*, before the Captivity), they would only need to be placed outside the first wall, as the second was not then built.

It would take too long to discuss the probable course of the second wall, on which so much appears to depend. I suppose the excavator alone will be able to settle this much-vexed question. A short piece of wall which appears to be Roman has certainly been found just inside the Church of the Holy Sepulchre, but public and private buildings may be supposed to have existed even in Roman times inside the city, and we may conclude they had walls. There is little reason, beyond the desire to find it, for supposing this to have been a city wall.

JERUSALEM, *December 12th*, 1898.

WOMAN IN THE EAST.

By Philip J. Baldensperger, Esq.

INTRODUCTION.

I have tried to compare the life of woman in Palestine, as she lives and works in the nineteenth century, with the woman of Bible ages. The reader will, it is hoped, be very indulgent if, in spite of the trouble taken to be as accurate as possible, errors may have slipped into the following pages. Woman in the East is a secluded being to a great degree, yet not as much so as is generally believed in the West.

As I was born in Jerusalem, and grew up in the country, living partly in towns, partly in villages and amongst the Bedawîn, the greater part of these observations are taken from memories extending more than twenty years back. In fact, without my mother—in the towns at least, where men are never admitted to the women's apartments—I could never have seen the interior of the houses; and among the other classes the facts have been gathered during a number of years by picking up grains, as it were, here and there. When compiled, the result does not seem to represent the labour of many years' observations, for these are condensed into a few pages.

Moreover, it must be remembered that it is now nearly six years since I left the Orient, and I had never intended writing anything till the idea struck me that many persons have an altogether false idea of the Oriental woman, and that I might contribute to knowledge in a slight degree by giving the benefit of my experience in the East—that is, in Palestine, more strictly speaking.

An article about Palestine which I wrote for the Palestine Exploration Fund was thus appreciated in their *Quarterly Statement* for October, 1893, by Major C. R. Conder, R.E., of the Executive Committee of the Fund, who for many years had travelled and made researches in Palestine:—"The article by Mr. Philip J. Baldensperger is one of the best sets of answers returned as yet to the questions which I arranged for the Society. The replies of school-teachers and educated natives have not been satisfactory, but the present correspondent shows that he has had

the *intimate acquaintance* with the peasantry which is requisite. . . . . My impression is that it is very difficult to get natives to talk on such subjects at all, and that information can only be got from residents who have had the special experience of Mr. Baldensperger. I hope he may go on . . . . and give us the full benefit of his experience."

Encouraged, or rather summoned, by the above, I now try my best to describe as clearly as possible the manners and customs, religious and superstitious beliefs of woman in the East, and if I do not show her in a new light altogether, at least I am trying to root out some errors which have slipped into descriptions, and especially where the case may present analogy in comparing her with the women of the Bible, being happy if I can contribute my part to the ever-interesting study of the Holy Land.

NICE, FRANCE, *August 12th*, 1898.

PART I.

CHAPTER I.—WOMAN IN THE TOWNS.

The European or American traveller landing at any port in the East is struck by the curious way in which women are dressed. Visiting any of the towns, he meets townswomen very different from the countrywomen, and it is well here to say that, generally speaking, the population of Palestine is divided into three very distinct classes, viz.: the townspeople; the country people, or sedentary agricultural population; and the nomadic Arabs, or Bedawîn. There are other nations, or tribes from other lands, who have settled in the country, but who are still considered strangers, as the Jews, the Turcomans, the Circassians, the Egyptians, and the Gipsies; these last have been in Palestine for many centuries, but have still a language of their own.

The townspeople are known as Madanié, from Madiné, the town; and el Medina, in Arabia, has its name from being the town of the Prophet, and is therefore designated by Moslems as Madinet en Nabi ("Town of the Prophet"). The difference between the habits of the Madanié and country people, or Fellahîn, as they will be called in the course of my narrative, is very great, and each one talks with great contempt of the other. "He is a Madani," or "He is but a Fellah"—these sentences tell enough. The townsfolk, or Madaniéh, are traders and mechanics, or are employed by Government or by townships.

The family life of the Madani himself is restricted to a mere nothing, for during day-time the man is about his business, and keeps his wife or wives strictly hidden from the looks of the outsider. The houses in towns are always built with this view of hiding the harem, or females. Very often the man has a slave, who acts as spy, and reports whatever may happen during his absence. Years ago a man of Jerusalem, who had a large harem and several slaves, had put one of his female slaves to guard the women folks. She obeyed his orders in a futile way, and was so brutally beaten that she sought refuge in our house, where she was at length discovered; and when her lord came and found her, he would have killed her from rage but for our intervention. Slavery is now abolished in Turkey—at least legally; but virtually it still exists, though, taken as a rule, the slaves are well treated, and when they have passed a number of years with a family, and all hopes of returning to their country have vanished, they become so attached that it is a punishment to dismiss them. This is always what people in favour of slavery advance—that a freed slave is helpless, and does not even care to leave his master's home. This may be quite true of slaves of both sexes who have passed, if not all, at least the greater part of their lives in the position of slavery, and who may have been well treated by their masters or mistresses. They find it very difficult to earn a living; for, it must be remembered, they were stolen from Central Africa, where they had been happy. No matter how poor or how naked they may have been in their homes, it was none of the business of the slave-dealers to go and catch them. Naturally enough, such boys or girls, taken away from their relatives, carried away hundreds of miles to the coast, and thence embarked to Asiatic ports, or even sold in African towns, are wholly at a loss. Never can such a slave, freed after having passed twenty or more years in the service of a man, wish anything better than to continue in slavery. His home may never be traced, the chances of his being recaptured on the way home are 999 in 1,000, he has learned nothing by which he can earn a living, and consequently is doomed to eternal slavery. Now it must here be said, in favour of such slavery, that marriages are contracted and new families formed exclusively on the master's purse; thus the slave is provided with whatever he or she wants—meat, drink, and clothing, and husband or wife are given; the children, too, are brought up on the master's account, and are free. The work of these slaves is easy:

they help their mistress in the cooking, carry home the things which the husband may have bought in the market, sweep the house and keep the kitchen utensils in order, bring water, hand it in clean glasses, and prepare the pipes for all the inmates, whether master, mistress, or grown-up sons.

The houses of the cities are all built with a small window above the gate, through which the inmates look to see if a caller is admissible. The flat roofs are always surrounded by high crenulated walls, through which persons on the roof can observe the surroundings, but cannot be seen from outside. These roofs are the general sitting places, and on warm evenings reception places. When a stranger approaches a house he knocks, and is not admitted except he be accompanied by a relative, either the owner of the house or some authorised man. In answer to the knock it is always asked: "Who is there?" The visitor says: "I." If his voice is known, the door is opened; if not, he is asked: "Who is 'I'?" "I, Ehmad, father of Fatmé." If the man's name be Ehmad, and his only daughter Fatmé, the slave-girl opens the door, and the grown-up women all take to some hiding place. The man now calls: "Be prepared," and, stepping in, says: "With permission." The answer: "Your permission is with you," being given, means all are hid, or at least the faces of the women. Though in Jaffa I have lived several years with the same house-owners, I never had so much as a chance peep at the lady of the house; though she sometimes gave me some information as curtly as possible, she always was wrapped up in such a manner that only words could penetrate. Though in the presence of their husbands they may talk to strangers, yet they considerably lower their natural voice; the less they know the person the less they talk to him, and then only give unavoidable answers. Should the newcomer be a guest, he may be shown into the parlour, and await the lord of the mansion, or the eunuch in very rich houses. During such a visit, when only the man can be present, the slave-girl, herself unveiled, attends to such wants as handing a pipe to smoke or the inevitable tiny cup of coffee. The conversation may be about political, religious, agricultural, or commercial events, but never does the visitor directly inquire after the housewife, though he may ask about the health of the family in general.

When I was quite a small boy, my mother used to take us along with her when visiting our neighbours. My eldest brother is called Theophil, and my mother was therefore known in the

neighbourhood as "Im-Taleel," a corruption of Theophil and Philip combined. For the women know only Arabic, and can hardly ever read or write, and so pronunciation is exceedingly difficult to them. Nowadays schooling has made some progress, but not one in a thousand of the women has ever attended any school. There are different kinds of schools all over the towns in Palestine. There is the Mohammedan school, in which little but the reading of the Koran is taught, and which is called the "book-place" (Kuttab). Then there is the Madrasé, or college, which is intended for men students who wish to graduate, and the most widely-spread are the Scolas, or Christian schools, of every denomination. But virtually these last-named are unknown to the Mohammedan women, and even should they be known, the Turkish Government does all in its power to prevent them from going to such schools. Some writing is also taught in the Kuttab, but unless the scholars intend to graduate, this first schooling is lost altogether from want of later practice; for they have no newspapers, and no books besides the Koran, which itself can be read and heard only by such as have leisure. Whilst reading this book the Moslem always sways his body to and fro, and repeats it in a singing tone, not caring what goes on around him. As they have no chairs, they usually sit on a mat, barefooted, with the legs crossed, and the book on the lap. In general conversation, during visits with my mother, after salutations were exchanged, and they had thanked God for good health, and asked God to be kind to the children, the flower topic was one of their favourite subjects. Every woman has one flower-pot or more in some corner of the roof or window, and is ever proud to offer her female visitors some of the nicest flowers. Pinks, stocks, gilly-flowers, and geraniums are the flowers they like most, or at least these are met with more commonly. They would often ask for seeds and flowers. When they used to visit us, in less time than it takes to read this they would be roaming about our garden, and would have cut all the flowers within their reach, and even rooted up some to plant at their homes, to the great annoyance of my mother. At home only do they stick flowers in the hair (for when they are out of doors the hair is never seen), and they keep a small bunch of basil, which plant is wanting in no house, on their breasts.

The next topic of conversation was marriage—why my mother did not look for brides for her sons. We were none of us more

than ten years old; but with them, boys and girls marry at the earliest possible age. A Turkish captain who lived over against our house, and had wives and sons and daughters and slaves, often invited us to his house. He married two of his sons at one time, aged eight and ten. During eight or ten days singing, dancing, shouting, and shooting went on; when the boys were married, the captain sent them to school together as husbands and wives. I remember especially the boy of ten and his wife, as they passed our house day after day, beating each other and fighting till they disappeared round the corner of the road leading to the school inside the Zion Gate, and again in the afternoon on their way home.

Christian schools are rarely visited by Mohammedan children who have both parents living, or are wealthy. Orphans may now and then be found brought up in Christian orphanages, which are found more especially in Jerusalem. Day schools are eagerly set up by all Christian confessions. The Arabic Christian population differs mainly as regards religion, whilst in the everyday life, and even in slave-owning, it resembles that of Mohammedans.

In the house the woman wears large pantaloons, as is the fashion of the modern female bicyclist, but these are made of very light printed cotton and reach to the ankles; a short dress is worn over this, and a waistcoat, often richly embroidered, with tight sleeves, whilst a handkerchief is carelessly thrown over the head, ever ready to be pulled over the face should a man appear. Always barefooted, the townswoman has wooden clogs with two supports under the soles, varying from 1 to 3 or 4 inches high, a leathern strap is nailed on above through which to pass the feet, and it is more or less ornamented with satin or silk embroidery; the clogs themselves also, in many cases, are adorned with inlaid mother of pearl in circles, triangles, or squares symmetrically arranged. The toes of the feet and nails of the hands of the woman are stained red with henna, which the pilgrims always bring home with them from Mecca for their wives and children. The palms of the hands are also coloured brown, in symmetrical lines. The hair all over the face and body is shaved or burnt, excepting the eyelashes and the hair of the head. The place where the eyebrows have been is painted black, as well as the eyelashes. The cheeks are painted a faint red, and the hair is dyed brown. Every woman has her small bottle containing kóhl and a fine brush or style to paint the eyes. This is the

general toilet of the townswoman at home. In the afternoon two or three hours are spent out of doors, and it is here the traveller sees those white moving mummies in a great white sheet (*the Izar*) thrown over the head and body, very neatly folded, and the ends tucked into the inner girdle; the face is covered with a thick, coloured veil so that the face of a woman can never be seen, whilst she can see everything. They may be seen in groups of three or more moving slowly towards the cemeteries, where they settle down either around the grave of some departed friend or relative, or along the roadside to look at passers by, and unconcernedly to make their observations about themselves, their neighbours, or the public. Their pockets and hands are full of eatables, and whilst conversing they go on cracking hazel nuts or hickory peas, or dexterously splitting with their teeth roasted and salted pumpkin seeds (offered for sale by hawkers), and by a quick movement of the tongue the peel is ejected. The days are past when sulphur-yellow soft-tanned sheepskin boots and shoes were the only foot-gear of the townswomen. The new-fashioned European black leather boots have penetrated even into out-of-the-way places and threaten to supersede the old fashion, even in secondary Mohammedan towns such as Hebron, Gaza, Nâblus, Tyre, &c.

The family life of the woman is restricted to women's society, for the husband, be he an official or a business man, is always away from his own womenfolk. At the age of ten or twelve the girl begins to veil her face, never again to show herself freely, not even to the nearest of kin, except her brother, and in many cases even he may not see her.

There are many Protestant and Roman Catholic natives who have in many respects left the old ways, and are trying hard to follow Western ideas, at all events as regards clothing and unveiled faces; whilst the women of the Greek Church still remain a little more like their Mohammedan sisters, and even in some places are shut up behind screens in the churches so as not to be seen by the men. In Jerusalem, where Greeks from Greece abound, the natives begin to follow the manners of those whom they meet at their devotions or at other assemblies. The Arabic woman brought up in this way does not very much feel the want of liberty, for having never possessed any, as compared with Europeans, she feels content with her lot, and at the age of ten or twelve a girl is wrapped up as a

woman, and must be veiled for the rest of her life in the presence of men.[1]

Chapter II.—Polygamy.

Polygamy is usual only among the wealthy Mohammedans, for the law really obliges the husband to provide for every wife a separate house, or at least separate rooms, and meals. All these expenses, and the wedding expenses besides, are very great, and the peace of the family is for ever gone on a second wife being taken.

A friend of our family, a certain Sheikh, was married to a relative of his, by whom he had two sons and a daughter. When she had no more children, he bought a white Circassian of Christian origin, who had been stolen from a Georgian district by Circassian robbers. He took her to wife, and when she had several sons she became ever more arrogant, till finally the first wife was jealous, but growing old and having no more children, she was discarded. On many occasions she bitterly complained about her new rival, and used to say:—"The father of Abed" (thus she always called her husband, her eldest son's name being Abed), "is rough with me, scolds me, even beats me sometimes. I am his first legitimate wife; I gave him two sons. I am his cousin, yet, woe to me! This slave is young and beautiful, but will never be a good wife. We have lived these many years together from our youth." Continual strife made the old man miserable, till he determined to send away one of his wives, and as a matter of course it was the first wife, who could no more give him any children, who was sent away without mercy and without feeling for her sons and daughter—sent away to her father's house, with money and stores to provide her for a time, as Hagar was sent away by Abraham with bread and water. But the separation from her beloved sons and daughter so much affected the poor woman that she died soon afterwards, cursing her rival. The Sheikh yet again married a

[1] Women in the East do not regard this as a hardship at all. It is to them a question of modesty, and they look on European women as being shameless. Moslem women also regard those who are not veiled as being immoral women. The Oriental women have sufficient liberty of going out, and take pride in being escorted by servants, whom they do not regard as their gaolers. The use of the veil also distinguishes ladies from peasant women. The word *Hormeh* for a woman means "secluded," and though applied to all classes it properly refers to ladies. Peasants and Arabs use the term *niswân* ("female persons") for the women.—C. R. C.

still younger woman, but his first wife could not be replaced, and he ever regretted Im 'Abed, "the mother of 'Abed." But still his Mohammedan ideas surpassed his family ideas, for the aim of the Mohammedan's life is to leave the largest possible number of male progeny, who can repeat their formula of faith, thus securing to him a sure position in after life. Though they have very vague ideas as to what becomes of women after death, the Mohammedan who has lived a faithful and religious life is provided with many *huriyés*, or freed women, in Heaven, and lives in a great palace which was built during the hours or minutes he has spent in prayer whilst on earth.[1]

Only four legitimate wives are allowed; the man may have more women, but they are only concubines, and his slaves generally also have children by their master, who, like Ishmael of old, are always considered sons of the bondwoman. He can swear to abandon one of the four wives—a partial divorce, and may then marry another one in her place, keeping the abandoned one in his house.

Chapter III.—Marriage.

This, of course, is always preceded by the betrothal. The fathers of bridegroom and bride agree that a certain sum is to be paid, which with the richer all goes towards jewellery and gold and silver ornaments for the girl, but with the poorer the father of the girl keeps a part. Before they agree definitively, the mother and sister of the bridegroom visit the girl, who is stripped naked, and they refuse to accept her if she be not very well formed. The dowry is now paid by the bridegroom's father, and when the whole sum and ornaments agreed upon are paid the marriage ceremony takes place. A week previous to the wedding the festivities begin in the house of the bridegroom, the women all assemble and an expert, sitting down, knocks in marked time on a small drum whilst she sings three lines, and is accompanied by all the women present with clapping of hands; at the fourth line the loud "zaghreet," or ululation, is uttered. When they can afford it they bring women singers from Egypt or Damascus, who have (at least, in Oriental ears) fine voices, and they are very proud of this, as these singers are often richly recompensed. We find

[1] Though Moslems disagree as to whether women have souls, the Koran distinctly speaks of the elect as entering Paradise with their earthly wives, but not in the same Surahs in which the Huris are noticed.—C. R. C.

in Eccles. ii, 8, Solomon mentioning amongst such things as only the wealthy can do, that "he brought him also *women singers*, and the delights of the sons of men, as musical instruments, and that of all sorts." The most renowned of such instruments, the "kanoon," is a sort of horizontal harp, and is the favourite instrument for weddings; to play this more easily they have a harp thimble on the fingers to touch the strings. These singers also dance, distorting their bodies, and clapping with the castanets to mark the time. The bride is loaded with ornaments and jewellery, either representing her dowry or in many cases only borrowed from her relatives, to adorn her for the occasion. She does not have a white wedding dress, but many coloured dresses, all which she wears successively, even if there are a dozen; she is clad in one in her room, then led forth by the women a few paces to be admired, and when this is done she is led back, another costume is put on and, if possible, other ornaments, and again she is led out, then back again, till all the dresses are thus shown to the bridegroom. She is now led through the streets to her bridegroom's house, where the final feast is given. This final procession is generally made in the evening; the singing of the women is always the loudest, the men, however, also accompanying. The wedding supper is now given to all friends and relatives; the better classes only go to such a wedding on invitation, whilst the mass of people go without any invitation, and as in the description of a marriage in St. Matt. xxii, 10, "As many as be found, both bad and good," furnish the wedding with guests. Food of all kind is served: the inevitable "pillaw," or boiled rice with butter coloured yellow with saffron, and other dishes of meat and vegetables, and many sweet dishes, amongst which the "ma'mool" is always seen; this is made of groats, sugar, and butter. When the dough is very stiff, nuts and pistachio nuts and a little jelly are put in and a small cake formed round this; it is baked without losing its pale colour, sugar is again strewed upon it, and the piles of these cakes are distributed amongst those really invited and of better class. Besides this "ma'mool," there is the "knafié," this is served on a large copper tray, as it is always dripping with the sweet with which it is prepared. The fine-flour dough mixed with sugar or honey and butter is first passed through a sieve, the long vermicelli-like strings flow on a copper plate, slightly heated till they are stiff enough to be taken away; when a heap of such strings is ready, thin cords of it are twisted and the ends put in the centre of the copper plate. They are now coiled round this centre

in spirals till the plate, the border of which is an inch high, is full, honey is then poured on the whole, and it is sent to the oven to be baked. It would be too long to enumerate the whole series of these sweet dishes, which are neither the same in number nor in the way of making in all the towns, and often the better-class families are more prodigal than the poorer in using dearer articles; the latter often make the dough for one of these sweets with the slightest taste only of the richer ingredients entering into them Besides the "ma'mool" and the "knafié," there is the "baclawé," the "imtabbak," the "timrié," and so on.

If the party is Christian the bride is led to the church, where the bridegroom awaits her, and the religious ceremony according to the confession is performed. The Mohammedan bride is not taken to their mosque, the religious part of the ceremony is done as quietly as possible by the kadi or judge of the place, who in Mohammedan countries is sacerdotal, and who alone may marry the couple. Only the bridegroom and the next male relative of the bride come into the room, and the judge addresses them somewhat as follows :—The two men holding each other's hands. First to the father of the bride: "Did you, Hassan, give Hamdé, the daughter of Hassan, to Khaleel to be her legal husband according to the profession of Abu Hanify?" The father of the bride, Hassan, answers: "I gave." The same question and answer are repeated a second and a third time. Then the judge addresses the bridegroom, and says: "Did you, Khaleel, accept Hamdé, the daughter of Hassan, that you may be her legal husband according to the profession of Abu Hanify?" The bridegroom answers: "I have accepted." And again a second and third time the same question and the same answer are repeated. All this is done apart from other people, for should any man or woman unfavourable to the marriage be within hearing distance they may hinder future happiness by various acts; smoking during the ceremony is believed to make all future felicity go up in smoke, strewing flour or earth on the ground is believed to throw away or even bury their happiness. These superstitions are believed in by all Mohammedans and Christians. Of these latter some few families brought up and educated in Christian schools have ceased to believe them, but should by marriage a less educated woman or man be introduced into the family, as among the Israelites of old, they again bow down to modern Baalim and Ashteroth, which have strongly taken root amongst the native inhabitants. And often even we find modern Sauls who have

passed their lives persecuting those having familiar spirits and wizards, but who come back in their old age to ask the witch at Endor what will happen on the morrow.

Superstitions and silly beliefs are so widely spread amongst the inhabitants, and so firmly believed by all natives, no matter to what religion or confession they belong, that this forms a kind of sub-religion in which the extremes meet a kind of third opinion, in which Occidental and Oriental Christians are wholly separated, and wherein native Christians and Mohammedans wholly agree. As long as these bonds of unity have not been thoroughly destroyed, so long also will the work of civilisation and evangelisation be exceedingly difficult amongst the Christian natives and still more so amongst the Mohammedans. Christ himself often had to fight against these superstitions and traditions, as when He says in Matt. xv, 6, to the scribes and Pharisees: "Thus have ye made the commandment of God of *none effect* by your tradition," or in Mark vii, 8: "Ye hold the tradition of men as the washing of pots and cups, and *many other* such like things ye do." More than a thousand years before Christ, King Saul is found trying to establish the pure religion. Centuries went by—Isaiah, Jeremiah in vain tried to abolish superstitions. And now nearly two thousand years later we meet the same beliefs still firmly held and hindering progress among the descendants, although under different denominations.

As already remarked, the Christian couple are united in the church, and here the bridegroom and bride (the latter veiled excepting among the occidentalised classes) are taken through the streets together at a very slow pace (this having become proverbial—"Slow as a bride")[1] to the bridegroom's house. Here the bride is taken in procession from her room to the bridegroom, continually changing her clothes, to display all she has before her husband, this often taking all the night through, till she is half dead in the morning.

All presents, clothes, household utensils, the never-forgotten looking-glass, and the bedding are carried on the heads of servants or porters in rear of the procession or in front to the house of the bridegroom.

The bride enters the house backwards, facing the bridegroom, a loaf of bread and jug of water are presented to her, she eats and drinks of this as a symbol of plenty for the future. A steel knife

[1] This also is a custom originating in ideas of modesty on the part of the women.—C. R. C.

is put on the threshold on which the bride steps before entering, this is intended to cut off all sorcery. At the door of the room the same ceremonies are gone through and the bride now puts her hand flat against the doorpost, whilst the bridegroom with his fist beats her on the hand as a token of her submission and of his authority. On entering the room she sits down and sups with the women, whilst the bridegroom has his supper with the men, and then bridegroom and bride again have a supper. All night through, singing, dancing, eating, and drinking are indulged in. The next day is the particular "women's feast," and the bride kisses the hand of everyone present. On receiving a gift of money the bride also kisses the hand of the giver. The feast is now ended, and everyone goes about his business. Eight or ten days later the bride is invited to her father's house, to which she will not go back unless invited, and should this invitation not be made it is considered a great offence.

Chapter IV.—Religious Feelings.

These are confined to certain observations, such as keeping the thirty days' fast of Ramadan, during which month all adult Mohammedans are expected to fast during daylight from meat, drink, and smoking, whilst the nights are spent in all kinds of revelry; wine and strong drink are forbidden to believers, and are never used by women. As the Mohammedan year has twelve lunar months they are continually losing, so that the same date is eleven days in advance on the following year, and they lose one year in about thirty-three of ours. In consequence of this moving of the months the fast is less difficult to keep when it comes during the short and cool winter days than when it occurs during the long and hot summer days. Where they can afford it amongst the richer classes they sleep away the fasting hours, whilst the poorer working classes have to bear the burden and heat of the day while fasting. The nights are turned to day, women visit each other, and enjoy to some degree their liberty, and alas! very often this liberty degenerates into debauchery. As they are strictly shut up during eleven months of the year, necessarily they abuse their liberty.

Women do pray sometimes, but not as a rule, as Mohammedan law virtually, if not actually, forbids prayers for women, or renders them next to impossible. It must be understood that prayers amongst Mohammedans are a repetition, twice to five

times of the same sentences, consisting of the first (opening) chapter of the Koran, to which, more or less, their own impressions may sometimes be added. As a rule, however, the believer has five prayers in twenty-four hours, which are obligatory. It is a debt every Moslem owes to God, and whoever misses them has to repeat them the next day, or afterwards; prayers of the same hours accumulate, and can only be said at the corresponding hour or hours. If one has been missed, next day it is to be repeated after the day's regular prayer. The five prayers are thus distributed during the day:—(1) The morning prayer, to be said from the first streaks of daylight till noon. (2) The midday prayer, from noon to about four o'clock. (3) The afternoon prayer, or 'Asr, from four to sunset. (4) The sunset prayer, from sunset to the disappearing of daylight. (5) The evening prayer, till midnight. At midnight some zealous persons may repeat prayers to the prophet Mohammed, but they are altogether optional. Prayers are preceded by ablutions, without which the prayer is useless. The hands and feet, face, and all issues are to be washed. With many sects women are considered so unclean that the very shadow of a woman falling on one who prays defiles the ablution, and this must be renewed. Under such circumstances, it may be easily understood how difficult it is for women to pray at all, as at certain times they are unfit even for ablution, and much more so for prayers. Thus, young girls, before the age of puberty, may begin to say prayers, but cease, not to begin again until they have passed the age of child-bearing. It is well here to say that old maids are practically unknown. During my many years' acquaintance with the Moslems of Palestine I have not met a single old maid that I can now remember. Amongst the native Christians I have known several. The place where prayers may be said is a point which helps Mohammedanism to a great extent, for they may be said in any clean place, either alone or in unison. The whole of the earth is clean.

Prayers forgotten in this life must be repeated in the next, at the gate of hell, on an elevated red hot flat iron plate, and every time the man touches the floor his forehead is burnt, and made whole again, and so on, till the whole of the missed prayers are gone through.

Before beginning the prayer the person quietly says: "I intend to pray," then spreading out the mantle, taking off his shoes, and facing Mecca (in Palestine this is to the south-east). First standing upright and lifting both hands to the sides of the

temples, then letting them fall again, then crossing them, next bowing, then standing up again; now going down on the knees, then kissing the ground, raising the body and kissing the ground again—this constitutes one "kneeling." Every prayer consists of two to five such kneelings. In every kneeling the first opening chapter of the Koran, known as the "fâti'ha," is said. A person in haste may say: "I am only going to pray two kneelings." Or in talking: "I just had prayed two kneelings when"—so and so. These prayers, as is easily understood, are supposed to benefit the performer a good deal, no matter how bad he or she may be—although they try to be good. To illustrate this: a person may be praying, and whilst praying he may not smile or think about anything else, but between two kneelings one may interrupt his prayer and, before getting up from the knees, make such observations as seem fit, or even altogether unfit according to our civilised notions. We will suppose a woman has "intended to pray," and given the kitchen in charge to her slave; she might interrupt her prayer at the end of one kneeling, saying: "Oh, Sa'idé (the name of the slave), look to the rice, it is steaming too fast"; then she may say her second and third kneeling, and remark that her slave does not pay attention. She may shriek out: "Cursed be your father, oh Sa'idé, wait till I have said my prayer; cursed be your grandfather and your great grandfather! I'll teach you to obey!"—then going on to pray. The following is a translation of the obligatory prayer:—"In the name of God the merciful, the compassionate. Thanks be to God, the Lord of the universe, the merciful, the compassionate. Who reigns on the Judgment Day. We worship thee, we honour thee. Guide unto us the straight way. The way of those on whom is favour, those who are no object of wrath, nor the erring. Amen." The path mentioned in the prayer is a supposed bridge which will be fixed on the Temple wall of Jerusalem on one side and on the top of the Mosque of Mount Olivet on the other, whilst a huge fire will fill the Valley of Jehoshaphat below. On the Judgment Day, when all men will be assembled on the Temple area, Mohammed will make them pass the bridge. All such as have said their prayers will pass to the other side, whilst such as have omitted them will fall into the fire. But Mohammed will save the Moslems after their having burned for a while.

Taken as a whole, the women are very careless in observing the prayers, should they even be fit after a given age to pray. Having passed their best age without praying, it is rare that they

begin to pray later on. The Arabic townswoman I have always compared with Lot's wife, or Michal, Saul's daughter, on an average. As exceptions there may be modern Miriams or Deborahs, two other types of townswomen. Though on every occasion of public rejoicing or sorrow a leader like Miriam of old is always present, singing before the women, and all others answer her—especially at funerals, or as mourners—yet such "fore singers" are supposed to be very wicked, and hell is their sure recompense, as wailing is forbidden by law. Miriam, the townswoman brought up in Egypt, very often in contact with the royal palace, shows her disdain to Zipporah the Bedawîn woman, Moses' wife. This latter, brought up in tents in the wilderness, was certainly very different to Miriam, and they were never on good terms. Therefore Miriam was punished for having spoken against Moses because of his Ethiopian wife. The modern townswoman, with the same disdain, will speak against the Bedawîn woman, for in fact they differ wholly from each other both in looks and dress and character.

Chapter V.—Superstitions.

Superstitions—as with all ignorant people, though possessing a certain degree of civilisation—are with women certainly stronger than religion, or, at all events, more firmly believed. Timid as is the nature of women in general, their timidity is here so exaggerated that no woman will step into a dark room even in her own house, but will always be accompanied and carry a light.

Evil spirits and all kinds of ghosts fill the Arabian world, whether Christian or Moslem, in and out of houses, in the country or in the town, on land or on water. Yet some places are naturally more haunted than others. Thus, cemeteries are especially alive with invisible beings, appearing and disappearing at will on Thursday evenings. Friday being the sacred day of the Mohammedans, the ghosts also assemble on the eve, for prayer or for mischief. It is therefore better to avoid cemeteries on Thursday evenings. Moslem ghosts appear frequently, and especially to Moslems, though sometimes also to native Christians, but baptism is a protection against the ghosts. Occidentals never see any, because they do not believe in them, therefore they do not appear; this is what I was assured to be a fact, because I said I had never met, nor seen, nor heard any.

There are five or six very distinct classes of ghosts, whilst the

chief class, and at the same time the most numerous (believed to number as many as there are human beings, if not more) live immediately underground, and are known as the Jân or Jinn—the generic name of all ghosts—though there are Jân species, who have different names and functions among the general mass of Jân. The Jân eat, drink, have their governors and Mohammedan laws, but have no food of their own; they have to provide for this from human beings. They are supposed to be ever lurking about dry food or cooking places. And if a woman touch any bread, or flour, or butter, or whatever it may be, and omit to call on the name of the Lord, the Jân immediately seize their portion of the food which they carry away unseen into their underground dwellings. Therefore, no woman will do anything, not so much as step out of a room, without saying: "In the name of God the merciful, the compassionate," and never will they talk about these ghosts save in a very respectful way, naming God at each other sentence, and they think it better to avoid talking of them at all, for the Jân listen to all that is said and see whatever is done and will take their vengeance. At certain moments they have power to kill persons should the human transgression as to the Jân be too great. They may also take human beings to be judged at their courts of justice, but I was assured that in the Jân's court there is no bribery—this only was to show *en passant* how corrupt the courts are on earth. There are men, women, and children amongst the Jân, and on some occasions they even intermarry with human beings.[1]

Whilst in Palestine I had a servant who did his work very well, and I wanted him to keep my bees in an isolated place several miles from Ramleh, in Philistia. After having refused altogether he informed me that a female Jân was in love with him, and so very jealous that she would make herself visible, at least to him, but only when he was quite alone. She struck him if he only smiled at any woman, but if she met him alone she would strike him half dead to the ground, so that he was sometimes stunned for several hours, in consequence of which he never

[1] The common term *majnûn*, used of persons who do anything foolish, does not mean "mad" but "bewitched," or possessed by the Jân. The Jân are divided into two classes, the one being Moslem, the other Kufâr or Pagan. The latter are the most malevolent. The Jân are born like human beings, but their bodies are of air or fire, not of flesh. The five classes of ghosts or spirits answer to our ideas of (1) demons (bad and good), (2) goblins, (3) ghosts, (4) gnomes guarding treasure, (5) doubles.—C. R. C.

went out alone, not even by day, as even then she appeared and scolded him for the merest trifles. It, however, transpired afterwards that this man was an epileptic. Yet again a male Jân may be in love with human women. Another man in my service had beaten his wife so brutally that she fell on the hearth. Of course, the Jân in love with her had a chance to take hold of her spirit as she had come down suddenly to his abode without calling "the merciful." This Jân told her at once to follow him to Egypt, where they could live openly together, whilst in the "Holy Land" this was not allowed to them. He had almost persuaded her to flee, when the priests became aware of it, and by praying and incensing they cut off the communication. The poor woman had been robbed of her senses when falling, and, her mind being ever full of the Jân, in her insanity talked of nothing but of the Jân, and a secret wish was also felt to leave her husband. When she became well again she left this off, but her Jân lover was only waiting for another occasion.

A second kind of ghost is the bad spirit called "Kird," more of a country devil or goblin.

Then comes the "Mared," a very tall spirit, appearing chiefly in towns, and in places where people have been killed, at first during the first year, then only periodically to remind the world where the spot is. Mohammedans drive big iron or wooden pegs into such a place to prevent these ghosts appearing, whilst Christians make a cross. This Mared is the terror of the townswomen, and not one but has had some adventure with him. For sometimes he not only appears but talks, calls, mocks, cries, or laughs. He is generally white.

Next is the "Rassad," or treasure-keeper, hovering over hidden treasures, and appearing when necessary to drive away the treasure-seekers or put them out of the track. It has the faculty of changing into all kinds of living things—into a single animal, or even into a number, as a hen and her chickens, or a red and a white filly. Sometimes this spirit attacks, sometimes only frightens away human beings.

The Kariné is a female spirit accompanying every woman, and has just the same number of children as the human woman, to whom she is attached. If the woman's character be good this spirit is also good and kind, if the woman be quarrelsome or anyhow of bad disposition the Kariné is so too, and even chastises the human children. King Solomon, who had power over the Jân, asked this spirit one day what her business was. She told

him: "Everything contrary to the happiness of conjugal life." She even gave the King directions how to charm her away. Such charms can be bought from dream-explainers, soothsayers, and the like.

Charms are very much believed in, and to find a more extensive market they are rarely good for two evils. Every charm is written, enveloped, burned, and so forth in a different way.

Besides good and evil spirits, men or women also may have a very bad influence on others. Especially the "Evil Eye" is very much feared. Now it is very remarkable with all these superstitions and beliefs the "name of God" is used only before the evil comes, never when the evil has effectually taken hold. On approaching a child or pet animal they will invariably say: "I surround you with God," or "God's name be upon you," "May the evil be out," and like expressions, before asking the name or health of the child. But should the effect of the Evil Eye in some way or other have done any harm, then charms alone are sought after. With a child as soon as it feels sick, whether from bad food or a cold, this is first attributed to the Evil Eye. The next thing is to find out the person who did the mischief, and, if possible, to get a piece of rag or any bit of clothing belonging to that person which is then burned below the child, and the fumes in many cases are considered salutary. Should the evil, however, be of a more obstinate nature experts are brought and they have many methods. One of the more simple methods is to take a piece of alum, salt, incense, and a piece of tamarisk wood, or palm of Palm Sunday, and to put all these ingredients in a pan on the fire, and take the child round it seven times. A cracking of the alum or salt indicates that the effect of the Evil Eye is broken. The Arabs also think "prevention is better than cure," and therefore to avoid the Evil Eye all kinds of charms are put round the necks and heads of children. Blue beads especially are often seen hanging around the head, or as a final bead in a necklace. Animals also have always a blue bead, or bone, or tortoise shell around the neck. Blue eyes are very rare amongst Arabs and are considered bad, therefore blue beads to attract the Evil Eye. But the effect of the Evil Eye is not confined to children, anybody may be brought to suffer from it. Written charms are sewed in a triangular leather bag, and either sewed into the head gear or worn round the neck, but generally in some invisible place lest the charm may be lost.

Chapter VI.—Sickness.

The nursing of the sick is practically unknown. Fatalism opposes human interference, everything is from God, and especially disease. So they are either altogether left to themselves or wrongly nursed. The sick person is given whatever may please him or her, and as doctors may not visit the women the task is a very difficult one, though in the large towns—Jerusalem, Beyrout, or Jaffa—where the Mission Medical Department has worked for nearly half a century, they have at length won some confidence, but still as a doctor must feel the pulse or see the tongue in many cases this is forbidden by the husband of Mohammedans. Christians have more confidence in European doctors. In spite of all precautions many will not take the medicines prescribed for them, or if the medicine has to be taken three or four times, and at the first time of taking, the cure be not almost immediate, it is thrown away, and perhaps ignorance or incapacity of the doctor is pretended. Koran verses are considered more efficacious in most cases, and they will sometimes only go to a doctor when almost all hope is gone. The native doctors practise blood-letting and give laxatives. They have no idea of holding to one remedy but will try a dozen on the same day, as the visitors may bring new knowledge. The sick room is continually full of noisy visitors who discuss the state of the sick person, every one knowing best what to do; so it is not unusual to find four or more groups, each one discussing a remedy, and wholly despising the other, whilst the patient, or at least the family, may accept them all, and try them in turns, at the same time assuring the patient that so and so tried it and she was healed, so and so refused and died, and so forth.

When a visitor comes to the sick the first thing he says is: "Your health," or "May evil be away," and the sick person will answer: "God spare you and let your children live." Then the person may say: "God's name on you," "Since when are you in bed," and so forth. Coffee is given to the visitors, and anything talked about except the sickness. The room of the sick is filled with smoke from the different pipes, and the nerves of the sick are thus put to a test. Never does it happen, as with Occidentals, that the sick person is kept quiet, for the more visits the more honour. Since the American College in Beyrout has created a medical

department, in which natives are brought up as medical men, the land at large has benefited a good deal. Yet, taken as a rule, the Western doctor is preferred in serious cases, and as the medical art has been introduced into the country by Occidentals this is easily understood.

Contagious diseases are not more carefully avoided by the mass of visitors than others; as everything that happens is due to destiny, and everything was written from the beginning, no precautions can help. Some years ago I lived with my wife and two girls of five and seven in Ramleh, and during the hot summer months we had taken up quarters in the Greek convent, where we had plenty of room, a fine view on the town, good air, and no intruders, only a few monks to keep the empty convent, which is more of an hostelry for the thousands of Greek pilgrims who pass by in winter. We took all we wanted from the market near, excepting water and fresh milk, which was brought to us every day. The small-pox was raging in the town, and many victims were buried daily. Many people vaccinated their children by help of quacks, or women who only dipped their lancet into the boils and so vaccinated the children, many refusing to give their children for taking the lymph, others taking them to native doctors, and so forth. The interpreter's family at the convent was also taken with the prevailing epidemic, and we did all in our power to explain to him that it was very dangerous to receive him in our rooms, as he might bring the small-pox to our children, who were neither vaccinated nor had they had the sickness. Then the milkwoman came lamenting the death of her daughter, and when we found that she had died by the small-pox my wife explained to her the danger of taking the milk, as all the family, their hands, clothes, &c., were necessarily infected, and that it was safer that she should stop bringing the milk for some time. Finally the woman left our house, after having been very disagreeable, and accusing us of want of trust in God. "Don't you know," she said, "that if it is God's will, you will have the small-pox, wherever you may be, and if it is not, He will preserve you, no matter in what close contact you are with the sick themselves?" There was no way of assuring her that, though we in some degree partook of her belief, yet we thought it right to avoid danger, and that God had given us sense enough to do so. A Christian boy of about twelve had also died, and was carried uncovered into the church just below our convent, so, finding the risk was too great, we left Ramleh for a few weeks, as we could combine work and pleasure,

and avoid a dangerous centre. When I came back some time after I was hailed as a deserter, a coward, and so forth, though it must be remembered I had nothing to do with visiting the sick or nursing. The whole population—Christian and Mohammedan—had thought we should remain and brave the epidemic, though it was none of our business so to do. It must not be concluded that they do not avoid it through courage or resignation to God's will, but rather from want of energy and want of thought, perhaps also want of means. I would not have left had I not had another house in Jaffa which, meanwhile, was empty. Cholera, plague, and the like are treated in the same negligent way. The government indeed does establish quarantine as soon as an epidemic is said to be raging in some neighbouring country or province, but this is most often only a means of making money.

Bites of venomous serpents, scorpions, or the like, are treated by serpent-charmers, and in case such are not to be had immediately, any *mollah* may be of use, chanting Koran passages, or putting such verses written on paper on the wounds. What keeps the people to this belief is the crafty way in which those charmers keep them in ignorance as to the venomous or harmless kinds of serpents. Surgery, just as in Western countries, is more of a real science, and many cases of radical cure I have known, which, given the very elementary instruments they possess, may be called very good. Broken arms, legs, fingers, and so forth, limbs that can be well adjusted and bandaged all round, are very quick to heal; whilst ribs, or such-like bones, or musket-ball wounds, are not easily healed. Scrofulous diseases are common, but scald-heads are the most common and detested. This is believed to be produced by a gecko, which is found in all houses in towns, or by bats dropping their excrements as they flutter about in the evenings.

Born cripples and deformed children are certainly an exception, and at all events a good deal less common than in the West, for various reasons. I may perhaps venture to suggest that a great, if not principal, cause is the total absence of stays, an article unknown to Oriental women. Civilisation alone will introduce this useless article into Arabian towns, and be in future a cause of producing more deformed children. Another reason may be that all women are married, and have consequently no illegitimate children whom they may have tried to discard. Again, the more children the happier the family; no regret is felt as to numbers, and full development is allowed. Cripples still may be born, but

from want of careful nursing, voluntarily or involuntarily, they seldom grow old, and mostly die as infants.

Ophthalmia is perhaps the disease most generally spread and doing the greatest mischief. Certain towns suffer a good deal more than others for various reasons. Jerusalem is more than 2,400 feet above the level of the sea, and though periodically eye diseases may prevail, and may also make many victims, yet this is nothing in comparison with Ramleh and Lydda. I may safely say that in neither of the last-named towns is there to be found a single family altogether free from eye disease of some kind or other. Hundreds of families I have seen in which every one perhaps had a different degree of the disease. Out of a hundred boys in a mission school, at least ninety-five had sore eyes of some sort, being either blind altogether or blind of one eye, or chronically dim-sighted, and so forth. This alarming state has been attributed to the terrible heat in summer—as Lydda is often termed "small hell"; others look for the cause in the sands which abound, and are driven into the eyes by the wind; yet again, many attribute it to the universal filthiness, for water is not always to be had, especially when the people go out of the town to live in the vineyards through the summer, and they are glad to have even the necessary water for food and drink. Some believe it due to the masses of cactus hedges which grow all around the gardens, and which are filled with minute thorns (especially when the fruit ripens), which are very easily blown by the wind, and thus carried into the eyes. I am inclined to think that this cause may be one, combined with others, which produces this disastrous calamity. Hospitals are increasing in all towns, but Jerusalem alone possesses a special Ophthalmic Hospital.

Red beads dangling about the diseased eyes are considered very salutary, and are seen very often hanging about the women and children. Years ago all Occidentals were supposed to be doctors, and no sooner did they pay a visit than they were asked for some kind of medicine. My mother, visiting the neighbours, was often also called the doctoress, "'Hakimé," and always carried with her some remedies. Amongst these the most demanded were always the eye-drops—*kutra*.

Thirty years ago we went to Hebron to look over the place. Hotels were unknown in that town then, so we dwelt for several days in the garden of a Mohammedan below a huge nut-tree. Several of the family, as usual, had sore eyes, and the "lapis infernalis," which was never wanting on such tours, was dropped

into the eyes after our having thoroughly washed them. Many years afterwards the woman, who had meanwhile become a widow, came regularly to visit my mother in Jerusalem, never forgetting to ask for the salutary eye-drops.

Another hideous town disease, though the patients come mostly from the country, is leprosy. Any traveller in the East remembers to have seen the rows of lepers sitting by the road outside the gates of the towns, stretching out their fingerless hands, and with a hoarse voice asking God's blessing and long life to the passers-by, in return for which wish they always receive coins. These people live in separate houses, which the municipalities put at their disposal, and in these all lepers are obliged to reside. Jerusalem is also the only town with a hospital for lepers; though they cannot be cured, they are better cared for, are taken away from mendicity, and are taught to pass their time in such work or distraction as is fit for them. The disease is incurable as mentioned, but happily for the nurses, if thorough cleanliness is observed, it is not contagious; but it is hereditary. Children are free from leprosy till the age of twelve, and in many instances the disease may even leap one generation to appear again in the next. The leprosy now found in Palestine is not the disease so often mentioned in the Bible. Moses' hand was leprous and "*as snow*," and Miriam became a leper as *white as snow*. The modern leprosy is different, and is only contagious if the matter from a leper be brought into the blood or into the wound of another. As already observed, lepers gather always around the towns, and as was the custom thousands of years ago, sit at the city gates and wait till the passers-by give them whatever they may happen to have.

Chapter VII.—Beggars.

Beggars of both sexes are met with in all towns, and, to a certain degree, are even liked, for charity is one of the precepts of Moslem law. It is a good thing to accomplish this duty by giving to the mendicants. There are also different classes—those who sit down by the roadside or such as go round to the houses. This class always knock at the door, and in a wailing tone say: "May God increase your wealth, my lady; God preserve to you your children. May God never show you misery; may He give you riches," &c. If the lady of the house be disposed to give anything, she will either throw down a coin or send a piece

of bread, or whatever cooked food she may happen to have. If she can dispose of nothing or may not feel inclined to give anything, she will call back: "May God give you!" whereupon, as a rule, the beggar retires and tries the next gate. With Occidentals they do not give way so easily, but continue to worry till they receive something. Mendicants of this class in the East, as everywhere else, are occasionally thieves or robbers, and often are very wealthy. The blind beggars, as a rule, are more liberally treated. But another class of holy men and beggars combined includes such as only beg in order to have something to eat and to be clothed. These are less troublesome; for, although they will sit down at the gate and sing in long and monotonous tunes either chapters of the Koran or stories in rhyme of the patriarchs, prophets, and saints, yet they are easily sent away by telling them "the Lord will provide." Many of this last-named class only beg as much as they need for the day, in many instances giving a portion away to a fellow-beggar who may not have had enough.

Chapter VIII.—Concluding Remarks.

All women in towns go to the public baths once a month—at least, if they can afford to pay, but this happens less often with the poorer classes. Friends and relations gather together and go to the bath as a kind of festival. In the house they do not, as a rule, wash themselves very often; want of water may be the cause in some towns, where the rain-water, as in Jerusalem, is the only supply. This is gathered in cisterns during the winter, and can never be used liberally. It is partly due, perhaps, to laziness, or even a slight kind of hydrophobia or fear of the water. Be it said here, to the credit of missionary work in general, that cleanliness and free intercourse with the women-folks are also rapidly opening a way to civilisation, though still only among the Christian population. Obedience of boys to their mothers is little regarded; many think it very manly if their sons disobey and even beat their mothers, being, alas! very often strongly supported by the fathers.

The meals are prepared by the women, but only the husband and other males eat together, leaving the women and children to follow. Boys and small girls do, however, very often eat with their fathers. The most common or national dish is the "Máhshey," consisting of rice and hashed meat, rolled together in vine leaves,

or hollowed vegetable marrows, into which the meat and rice are stuffed. Sour grapes are often squeezed on the leaves when rolled to hold them faster together. The marrow is also often cooked in sour milk; to both dishes butter is added, and then cooked for an hour or two. Excepting for the better classes, who have a kitchen, most of the people have only portable clay-stoves, on which the charcoal fire is set, and, after burning for some time on the terrace, is brought into the room or the "Liwan"—an open porch, generally as spacious as a room, where in the warm summer months the family pass most of the time cooking, sewing, receiving visits, sitting down in the evenings, and sleeping in the night. The bedding consists of a carpet spread on the mat on the floor of the sitting-room, and in some cases a thin mattress; a pillow and a very thick cotton or wool stuffed quilt finishes the whole bed. Sheets are unknown, and undressing for going to bed consists only in loosing the girdle and taking off thick furs or overcoats and over-trousers for the men. The nights again, in many cases at least, are not consecrated altogether to sleep, but passed in sleeping a few hours, then getting up, perhaps to smoke a cigarette or drink water, and sleeping again, and as they are only half undressed this is greatly facilitated. In spite of these irregular nights they are all early risers, but go also early to bed.

In the small town of Ramleh, where we generally passed one or two summer months, we lived in close contact with both Christian and Mohammedan families. An old Moslem midwife lived in the courtyard below us; she had with her a married son who knew how to read and write, and was considered a consecrated clerk, gaining his living by writing charms for the sick, and reading or chanting at the houses; also his wife, a young woman of twenty, with a baby and two children of eight and ten of her own. Early in the morning the old woman was up and prepared coffee for herself, then she began waking the girl of eight, using the same words day after day, so one day I wrote down literally what she said, and give it as nearly as it can be interpreted, the child's name being 'Ghanimeh:—"'Ghanimeh, the time is past. I believe sleep is sweet in your eyes; get up. (Louder.) By the Almighty God, get up. I'll curse the father of your father. By God, cursed be the heart of thy father; get up! (After half a minute, still louder.) Get up, blood spout out of your throat, get up . . . . Oh, Lord, give patience . . . . Madame 'Ghanimeh (and in angry, ringing tones) 'Ghanimeh—'Ghanimeh—get up! . . . . (After another pause.) Eh! eh! eh! Blood spout out of

thy throat—will you get up?" and so forth. At length the girl so aroused sat up, but had nothing to do but listen to the cursing of her mother, who now went on to awake the brother with fresh compliments, such as: "Your father was a learned man; when will you get up to go to school? Do you want to sleep away like an animal? Arise, before I call the pestilence to scatter you all." Happily this is an exception; yet the rising in the morning is supposed to be very salutary, and, as a rule, no jokes are allowed in the early morning hours.[1] All kinds of exclamations are heard —mostly addressed to God. "Oh, bountiful!" "Oh, merciful!" and so on; or if anything is asked in the morning, they generally refuse to answer, saying: "Oh, giver, Oh, opener—let us see ourselves or our Lord's face on this morning." With the same words, or something like them, beggars are sent away in the morning. The people, as a rule, are very grave in the morning, whilst the evenings are spent in all kinds of amusements, such as giving each other riddles, generally in rhymes, or social games, or telling stories of kings and princes, riches, and wonderful tales of the thousand and one nights, fables, and so forth. As a rule, most of the above applies to Mohammedans: yet I have tried to point out where the difference is marked. Christian women are less shy of Occidentals, and in many instances are quite sociable, yet come back to their old habits when alone.

On a visit one day in a small town we were invited by a native Christian to sleep in his house for that night. My wife and I had to share the only room with the man and his wife and a ten-year-old boy. After supper and a couple of hours of chatting, we all went to bed. For us they had prepared an improvised bed on the long sofa, whilst they lay down on the floor, as was their custom. What about rest? Fleas abounded; and the door was being opened and shut so often that I at length inquired what might have happened. But nothing unusual seemed to be the matter. So I tried to sleep. "Um-Elias," called out the man, "where are the matches?" Then the woman, handing over the matches, tries to sleep again. After perhaps half an hour another call for the glass, as he is thirsty and wants a drink of water. Again this is granted. Then again half an hour's sleep, and another loud call to the wife to see if the boy wants anything,

[1] The sleeper is wakened cautiously, and at first with fair words and in a low voice, not from any idea of the bad effect of a shock, but because the soul is believed to have left the body during sleep, and must be gently invited back, or otherwise it might not return and the sleeper would die.—C. R. C.

or whether he is covered up, though the boy may be fast asleep, and so on, till morning at length ended this restless night.

If any of my Oriental friends should come across these lines I must ask their indulgence if they think that any of the above generalities are not applicable to themselves; it does by no means follow that if there are exceptions to the rule, the statements which I give, and which may be unpleasing to some, are in any way incorrect.

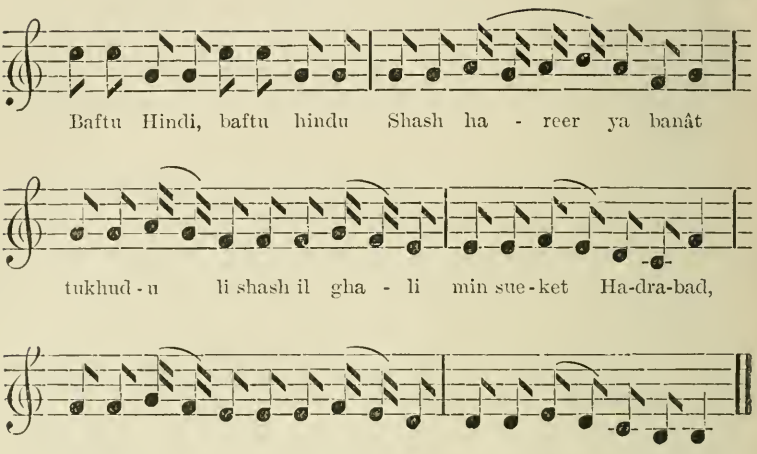
Woman in the *harem* is, relatively speaking, perhaps happier than the Occidental lady can imagine her to be, for her manner of living in seclusion, strictly separated from men, gives her another conception of happiness and freedom, for which in one sense they do not even care, wholly ignoring any other condition of life. But even the Christian woman in Palestine, though the only wife, is practically secluded from masculine society, except her husband's, and in most cases she is treated as an inferior being. Whether Mohammedan or Christian, townswoman or Fellaha, a flogging is always in reserve for her, and few women can actually boast of "not having received any at all," however rare it may be with some. Sitting together in a family circle and enjoying family conversation is altogether out of their knowledge and customs.

A man will generally say in talking of his wife to another man: "With apologies to yourself, it is only my secluded one." Many speak of "the mother of so and so," naming the eldest son.

Rarely has a man full and entire confidence in his wife, as for the merest trifle she will swear "by God," or "by her father's life," or "by her eyes" that what she says is exact. The Gospel teaching, originally pronounced in Palestine, "Let your words be yea, yea—and nay, nay," is wholly unknown to Orientals.

New songs originate either in Cairo or in Beyrout, and are taught by travellers going the round of all Egypt and Syria. Some years ago a song thus appeared, and was soon heard in all towns, sung by great and small. Though it has many verses, I still retain a few, and try to give the tune as near as I can remember:—

Indian Muslin. *Baft-u-Hindi*



1.

Indian muslin! Indian muslin!
Silken muslin, O ye maids!
None there is, equal to this muslin!
Open here, at once, your gates.

2.

And she opened, and she told me,
Come, light of my eyes, and rest,
Everything is waiting for thee,
Ostrich feathers of the best.

3.

Nothing is, but he has seen it.
To the coffee of Beyrout.
Farideh's singing, he has heard it,
And Rogetta play the lute.

4.

Tell me, O you fairy maiden,
Why you turn your face from me?
Well, the Turks have stole you from me,
Left me wailing quite alone.

5.

Listen, ye who are so joyous,
I will warn you yet once more:
Harm in opium drink is lurking,
Therefore keep your spirit pure.

(*To be continued.*)

NOTES ON THE ANTIQUITIES OF THE BOOK OF JOSHUA.

By Lieut.-Colonel Conder, LL.D., R.E.

Gilgal.—It has been argued that there is a double narrative in the account of the passage of Jordan and of the erection of a monument of twelve stones. One such monument was erected at Gilgal ("the circle"), the other is supposed to have been erected in the bed of the Jordan, the two accounts being thought by some critics to be distinct stories. It is not very evident what would be the object of putting up a monument which would never be seen, under the Jordan. The Septuagint and the Vulgate understood it so, and added the word "other," making "twelve other stones," but it seems probable that the references are all to one monument at Gilgal as follows :—

"And the children of Israel . . . . took up twelve stones out of the midst of Jordan . . . . and carried them over with them to the place where they lodged, and set them (וינחום) there. And twelve stones Joshua raised (הקים) amid Jordan (from) beneath (תחת), the standing place of the priests bearing the Ark of the Covenant, and they are there (שם) unto this day" (Joshua iv, 8, 9). "And the twelve stones that they took out of Jordan Joshua raised (הקים) in a Gilgal" (verse 20).

There is no mention of "other" stones in the Hebrew, and, if they were set up in the place where the priests stood in Jordan, we should have expected to read "raised over (על) the place," not "under" (תחת), the "station of the feet" (מצב רגלי). Nor is it clear how such stones could be known to be under Jordan "unto this day," whereas they long remained visible at Gilgal.

Ai.—It is worthy of remark that Joshua made Ai a "heap" for ever (viii, 28), but that in 702 B.C. it was an inhabited town (Isa. x, 28). It is not enumerated as such in the geography of Joshua (xviii, 23), and it would be natural to suppose that this passage was written earlier than the time of rebuilding this town. The great "heap of stones" (viii, 29) where the King of Ai was buried, near the gate of the town, may be the existing great stone heap called *et Tell* immediately north of *Haiyân*, the ruin which exactly fits the minute description of Ai, as a city east of Bethel, with a deep valley to its north, and another (viii, 12) apparently on its west, near the desert of Bethaven (vii, 2).

The Battle of Gibeon.—The extract from the Book of Jasher (Joshua x, 13) is in the form of a couplet. The word used for the "standing still" of the sun (דום) means, according to the margin, "dumbness" of the sun, but it may be rendered (like the Assyrian *damu*) "obscurity," in which case an eclipse would be intended :—

> "Sun be dark on Gibeon,
> And moon on Vale of Ajalon."

The writer continues:—"And the sun was (dark?) and the moon remained." "So the sun was (dark?) in mid-heaven and hasted not to come out nearly all day" (verse 13).

The Hivites.—There is no account of the conquest of Central Palestine. The cities that submitted (Joshua ix, 17) were Hivite cities (v. 7), and the inhabitants of Shechem were Hivites (Gen. xxxiv, 2). Perhaps, therefore, the submission of the Hivite league led to that of the country round Shechem.

NOTES ON ANTIQUITIES OF THE BOOK OF JUDGES.

By Lieut.-Colonel Conder, LL.D., R.E.

Bochim.—Nothing is known of this site, except that it was above Gilgal, and a place of sacrifice (Judges ii, 1, 5); the word means "weepers," and may be connected with Allon Bachuth (Gen. xxxv, 8), "the oak of weeping." The latter was at Bethel, and Bethel was the place of religious meeting in the time of the Judges (Judges xx, 27).

The Levites.—It has been said that the Levites are represented as being members of other tribes (Judges xvii, 7), but the term *Gur*, applied to the Levite in this case, proves the contrary. The *Gur* (Arabic *Jâr*, A.V. "sojourner") means properly the man of any tribe living in another tribe. In the present case the Levite lived "among the family" (מִמִּשְׁפַּחַת) of Judah, and sought (verse 9) to become a *gur* anywhere else where he might be accepted. The Levite, who was *gur* in Ephraim, might, however, be connected by marriage with the tribe of Judah (Judges xix, 1). In the first-mentioned case the Levite was a grandson of Moses (Judges xviii, 30), though a later scribe introduced confusion by writing the letter *N* over the name of Moses (as it still stands in the St. Petersburg MS.), and so made him a descendant, not of Levi, but of Manasseh. In the same verse the "captivity of the land" is a corruption for "captivity of the Ark" (according to the same MS.), which earlier reading agrees with the words that follow: "all the time there was a House of God in Shiloh."

In this connection it is to be noticed that, although the Levites were thus scattered in other cities, not always assigned to them, they yet were accustomed, in the time of the Judges, to go up to the central shrine at Shiloh (Judges xix, 18), or "House of Jehovah," where a yearly feast was observed (Judges xxi, 19). Gibeah was probably chosen as a resting-place by the Levite (xix, 15), because it was a Levitical city (Joshua xxi, 17), and his host, who was not a Benjamite, may have been a Levite. The fact that Levites resided in other than Levitical cities does not prove that such special cities had not been allotted, for Levites might sell or pawn their houses (Levit. xxv, 33).

NEW HITTITE TEXTS.

By Lieut.-Colonel Conder, LL.D., R.E.

Since the publication of my volume on the "Hittites and their Language" (Blackwood, 1898), two new Hittite texts have been found (*see* "Proceedings Soc. Bib. Arch.," June 7th, 1898, p. 230; November 1st, 1898, p. 265). The first of these is a seal, said to come from Malatiya, in Armenia. The reading appears to me to be *Mo si Kas Makh Za-bu ra dimmo*—"This is the seal of Prince Zabu of the land of Kas" (Kassite). Zabu was the third king of the first Kassite dynasty in Babylon (probably about 2201–2187 B.C.), and the reading thus seems to confirm the view that the Hittite texts belong to this dynasty.

The second text, in three lines, said to come either from Malatiya or from Angora, is imperfectly copied, and not clear enough to read, but it is remarkable that the first eight emblems are the same, and occur in the same order, as those beginning a text found at Arslan Tepe, three miles north-east of Malatiya (*see* Plate XII, No. 3, in my book above-mentioned), which fact should assist decipherment.

Dr. Sayce is of opinion that some of the texts in cuneiform, recently found at Boghaz Keui, are in the same language used by Tar-Khundara, Prince of Rezeph, in the Tell Amarna Collection (Berlin, No. 10). This is only natural, since, as I have pointed out, the Hittite and Mitanni languages appear to be the same. But it does not aid us to decipher Hittite emblems.

The detailed history of the first dynasty of Babylon, just published by the British Museum (*see* "Proceedings Soc. Bib. Arch.," January 10th, 1898) is of interest, first because (like the well-known letter of Ammi Satana) it is written in Akkadian, and secondly, because it speaks of the conquest of Aleppo as early as the time of the second king Sumulan. These indications agree with the view I have put forward, that these monarchs were of Akkadian (not of Semitic) origin and conquered in the West, where the Hittite texts are now found.

THE
PALESTINE EXPLORATION FUND.

NOTES AND NEWS.

The Annual Meeting of the Fund will take place in the Royal Institution, Albemarle Street, on the 11th of July, at 4 p.m. Major-General Sir Charles Wilson, K.C.B., R.E., will give an address on his recent travels in Moab and Edom, to be illustrated by lantern views. Tickets of admission can be had on application to the Acting Secretary.

In the present number will be found Dr. Bliss's third report on the work at Tell Zakarîya, and his first report from Tell-es-Sâfi, where operations were commenced on May 4th. In addition to the drawings illustrating the reports, Mr. Macalister has also contributed an interesting account of the ancient Church recently explored at Umm er Rûs.

The visit of Sir Charles Wilson to the excavations at Tell Zakarîya and to many of the Jewish colonies in the course of his journey through Palestine, as well as his travels in Moab and Edom, are of great interest. He has kindly promised to contribute some notes on his journey to the next *Quarterly Statement*.

A number of moulds of the various objects found in the excavations have been received at the office of the Fund, consisting of inscribed weights, jar-handles, scarabs, &c. They can be seen, and casts of several can be obtained, on application to Mr. Armstrong.

An elaborate paper on "The Ancient Standards of Measure in the East," by Sir Charles Warren, K.C.B., R.E., is published in the current number.

Owing to the pressure on our space the continuation of Mr. Baldensperger's paper on "Woman in the East" and the publication of several other important communications are postponed.

The Committee have made arrangements with Dr. Schumacher for the prompt and regular transmission of information respecting archæological discoveries which may be made in carrying on the work of the Acre–Damascus railway.

The concluding volume of Professor Ganneau's "Archæological Researches in Jerusalem and its Neighbourhood" is in the press, and will be published shortly.

In order to make up complete sets of the "Quarterly Statement," the Committee will be very glad to receive any of the back numbers.

Dr. Bliss's detailed account of his three years' work at Jerusalem, published as a separate volume, with the title "Excavations at Jerusalem, 1894–1897," and copiously illustrated with maps and plans, may be procured at the office of the Fund. Price to subscribers to the work of the Fund, 8*s.* 6*d.*, post free.

The "Flora of Syria, Palestine, and Sinai," by the Rev. George E. Post, M.D., Beirût, Syria, containing descriptions of all the Phaenogams and Acrogens of the region, and illustrated by 441 woodcuts, may be had at the office of the Fund, price 21*s.*

The legacy of $1,000, less $75 war tax, referred to in the *Quarterly Statement* for January, p. 5, has been received from the executors of the late Rev. Walter G. Webster, through our Hon. General Secretary, the Rev. Professor Theodore F. Wright.

The income of the Society from March 24th to June 22nd, 1899, was—from Annual Subscriptions and Donations, including Legacy and Local Societies, £427 5*s.* 2*d.*; from Lectures, 10*s.*; from sales of publications, &c., £116 4*s.* 7*d.*; total, £543 19*s.* 9*d.* The expenditure during the same period was £827 12*s.* 10*d.* On June 22nd the balance in the Bank was £461 8*s.* 1*d.*

Subscribers in U.S.A. to the work of the Fund will please note that they can procure copies of any of the publications from the Rev. Professor Theo. F. Wright, Honorary General Secretary to the Fund, 42, Quincy Street, Cambridge, Mass.

The price of a complete set of the translations published by the Palestine Pilgrims' Text Society, in 13 volumes, with general index, bound in cloth, is £10 10*s*. A catalogue describing the contents of each volume can be had on application to the Secretary, 38, Conduit Street.

The Museum at the office of the Fund, at 38, Conduit Street (a few doors from Bond Street), is open to visitors every week-day from 10 o'clock till 5, except Saturdays, when it is closed at 2 p.m.

It may be well to mention that plans and photographs alluded to in the reports from Jerusalem and elsewhere cannot all be published, but all are preserved in the office of the Fund, where they may be seen by subscribers.

While desiring to give publicity to proposed identifications and other theories advanced by officers of the Fund and contributors to the pages of the *Quarterly Statement*, the Committee wish it to be distinctly understood that by publishing them in the *Quarterly Statement* they neither sanction nor adopt them.

Subscribers who do not receive the *Quarterly Statement* regularly are asked to send a note to the Acting Secretary. Great care is taken to forward each number to those who are entitled to receive it, but changes of address and other causes occasionally give rise to omissions.

Tourists are cordially invited to visit the Loan Collection of "Antiques" in the Jerusalem Association Room of the Palestine Exploration Fund, opposite the Tower of David, Jerusalem. Hours: 8 to 12, and 2 to 6. Maps of Palestine and Palestine Exploration Fund publications are kept for sale.

Photographs of Dr. Schick's models (1) of the Temple of Solomon, (2) of the Herodian Temple, (3) of the Haram Area during the Christian occupation of Jerusalem, and (4) of the Haram Area as it is at present, have been received at the office of the Fund. Sets of these photographs, with an explanation by Dr. Schick, can be purchased by applying to the Secretary, 38, Conduit Street, W.

Branch Associations of the Bible Society, all Sunday Schools within the Sunday School Institute, the Sunday School Union, and the Wesleyan

Sunday School Institute, will please observe that by a special Resolution of the Committee they will henceforth be treated as subscribers and be allowed to purchase the books and maps (by application only to the Secretary) at reduced price.

The Committee of the Palestine Exploration Fund desire to make clear that they have no book on their List of Publications called "Picturesque Palestine," nor is any person authorised to represent this book as published by the Society; nor has the Society any book-hawkers in its employment.

The Committee will be glad to receive donations of Books to the Library of the Fund, which already contains many works of great value relating to Palestine and other Bible Lands. A catalogue of Books in the Library will be found in the July *Quarterly Statement*, 1893.

The Committee acknowledge with thanks the following donations to the Library of the Fund :—

"Receuil d'Archéologie Orientale." Publié par M. Clermont-Ganneau. Tome III, Livraisons 1–13. *Sommaire :*—§ 1. Le cippe phénicien du Rab Abdmiskar; § 2. La grande inscription phénicienne nouvellement découverte à Carthage; § 3. Le *mazrah* et les *curiæ*, *collegia*, ou *ordines* carthaginois dans le Tarif du sacrifice de Marseille et dans les inscriptions néopuniques de Maktar et d'Altiburos; § 4. Deux nouveaux *lychnaria* grec et arabe; § 5. Sur deux inscriptions funéraires de Palmyre; § 6. La Nea, où l'église de la Vierge de Justinien à Jérusalem; § 7. Inscriptions des croisades découvertes à la Khânkâh de Jérusalem; § 8. Inscription araméenne de Cappadoce; § 9. Amphores à épigraphes grecques et jarre à épigraphe sémitique provenant d'un sépulcre phénicien; § 10. L'inscription nabatéenne de Kanatha (*à suivre*); § 11. Sur un poids en plomb à légendes grecques provenant de Syrie; § 12. Le dieu Tamoûz et Melek Tâoûs; § 13. Jéhovah et la déesse Qadech; § 14. Le "puits" des Tombeaux des rois de Juda; § 15. L'hémisphère, *absida* ou *ciborium* du Martyrion de Constantin et de la Mosquée d'Omar; § 16. Chroniques syriaques relatives à la Syrie arabe; § 17. Notes sur le Haurân; § 18. Notes sur le pays de Basan; § 19. Les noms de la chauve-souris en syriaque et en hébreu; § 20. Les dialectes arabes vulgaires de l'Afrique du Nord; § 21. La stèle A de Neîrab; § 22. Le titre palmyrénien de *kachîch*, "senateur"; § 23. La *sébastè* d'après une nouvelle inscription grecque; § 24. Le nom carthaginois de Sophonibe; § 25. Nouvelle inscription hébraïque et grecque à la limite de Gezer; § 26. Le chapitre de Saint Sépulcre et l'abbaye du Mont-Sion; § 27. L'oiseau emblématique de Karak; § 28. Le titre romain d'Odeinat, roi de Palmyre; § 29. Les *berquils* ou "réservoirs" des Croisés; § 30. Les Phéniciens en Grèce (*à suivre*); § 31. Sceau phénicien au nom de Milek-ya'zor; § 32. Sceau israélite au nom d'Abigaîl, femme de 'Asayahou; § 33. Notes d'épigraphie palmyré-

nienne; § 34. Tanit et Perséphone-Artémis; § 35. Quatre nouveaux Sceaux à légendes semitiques; § 36. La famille royale de Palmyre, d'après une nouvelle inscription; § 37. Hébron et Diocletianoupolis; § 38. Le mois de Qinian-Juillet du calendrier palmyrénien; § 39. Une "éponge américaine" du VI siècle avant notre ère.

"The Babylonian Expedition of the University of Pennsylvania." Series A, Cuneiform texts. Edited by Professor H. V. Hilprecht. Vol. I, Part 1, 1893, Plates 1–50; Part 2, 1896, Plates 51–100.

"Journal of the American Oriental Society" (Vol. XX, first half). From the Editor, Professor George F. Moore, Andover Theological Seminary.

"The Hebrew Bible and Science." From the Author, Rev. W. Collins Badger, M.A.

"Bulletin de la Société Neuchateloise de Geographie." Tome XI, 1899.

For list of the authorised lecturers for the Society see *Quarterly Statement* for April last.

THIRD REPORT ON THE EXCAVATIONS AT TELL ZAKARÎYA.

By F. J. Bliss, Ph.D.

With the last report we published a plan of the Fortress of Tell Zakarîya as traced up to Christmas, 1898. Since then we have completed the excavation of the east side, have laid bare to the rock the north half of the west wall along its inside face, and have re-surveyed the whole building. Many of the inferences made during the first season's work have been justified, while the following of new clues has led to the reconsideration of others. The plan (I) now published shows the outlines of the fortress according to the latest results, together with the walls and other remains found in the course of clearing to the rock about one-half the area which it encloses. To these are added remains of buildings found in trenches outside the large clearance.

On p. 91 of the last report I stated that while Tower II was a later addition to the fortress, Towers III, IV, V, and VI were bonded into the main walls. Our work since has shown that all the towers have been added on to an originally plain building. On p. 92 I mentioned that on the inside face of the west wall of the fortress, at a point opposite to its junction with the north wall of Tower IV, a vertical joint occurs, the masonry to the left of the joint being better set. A similar joint has since been observed at a point in the wall opposite to its junction with the south wall of Tower IV, but in this case the better-set masonry occurs to the right of the joint. Both joints extend to the rock. Hence, instead of our having a contemporary tower bonded into the main wall, we have a later tower bodily let into a breach in the wall. From a study of the masonry drawn on Plate III, it would appear that the sides of the breach were made plumb at the time of the insertion of the tower. The bossed stones mentioned on p. 93, which were apparently taken from some other place, thus belong to the period of the tower, which contains similar stones. A

further examination of Towers I and V showed similar joints. In the case of Tower I it was proved that the breach in the wall had not reached to the rock. Tower II, as we have already stated, is simply added on to the main wall, which runs behind it. The north side of Tower III is let in as shown by a vertical joint to the rock in the main wall opposite to the point of junction. No such joint occurs in the west wall; hence we infer that the south wall of the tower merely butted against the fortress, though at the point of junction it was ruined down to a great depth and covered with large, fallen stones which prevented our verifying the matter. Practical considerations decided us not to test the question at Tower VI, but having proved that five of the towers were added on to the main building, it seems legitimate to infer that the sixth was a similar addition.

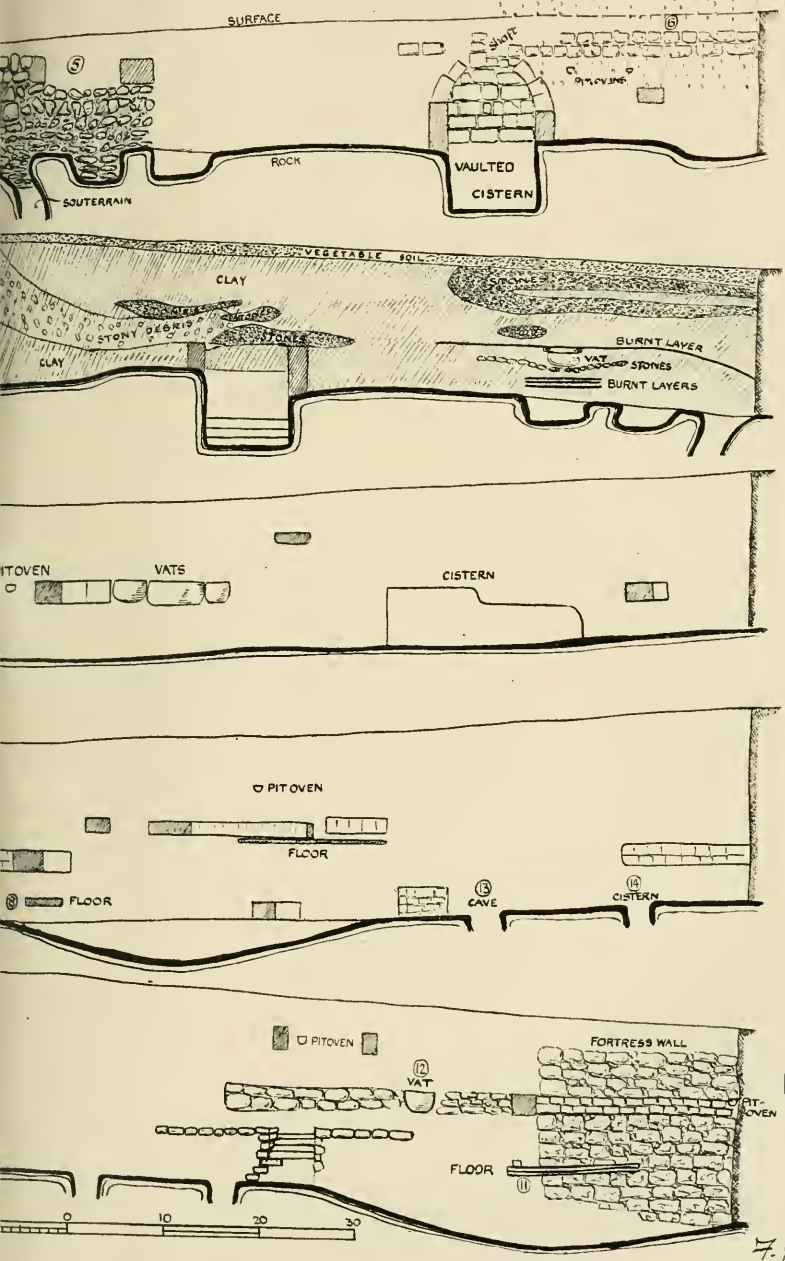
We have described the entrances into Towers III and IV from the fortress, and have shown that the door-sill at Tower III is only 3 feet higher than that at Tower IV. We argued that the levels of these doorways represented in general the ground level of the interior of the fortress at the time of its construction, and that the two lower strata of *débris* must have accumulated before the fortress was built, its foundations being sunk in this *débris*. Taken by itself the discovery that the towers are a later addition would weaken the force of this argument, if not destroy it altogether. But that the foundations of the walls were built down into *débris* was proved in another way. From the door-sill at Tower III an offset of $8\frac{1}{2}$ inches was traced along the inside face of the west wall as far as the point where Tower IV is let in. The level of this offset ranges from 9 to 14 feet above the rock. The masonry below it is smaller and ruder than that above. At several points, some 4 or 5 feet below the level of the offset, I recognised distinct traces of the original trench which had been dug for the wall foundations. At these points the trench had been cut 2 or 3 inches wider than the breadth of the walls, and owing to stones fallen against the wall, or some such obstacle, the space between the trench and the wall had not got filled up. Above the offset four courses of masonry occur, consisting of larger

and better squared stones than those found below. The two lower of these courses are interrupted at one point by a drain, about 3 feet 3 inches square in section, which runs through the wall.

I must admit that in view of the fact that a considerable amount of *débris* existed when the main walls of the fortress were built, and that probably more had accumulated when the towers were added on, it is puzzling to find the straight joints extending below the supposed ground line to the rock at two points at Tower IV, and at one point at Tower III. However, that the towers were let in as described above appears to me to be the only explanation of these joints. At Tower I, as stated before, the straight joint does not extend to the rock, the lower part of the main wall serving as the lower part of the back wall of this tower.

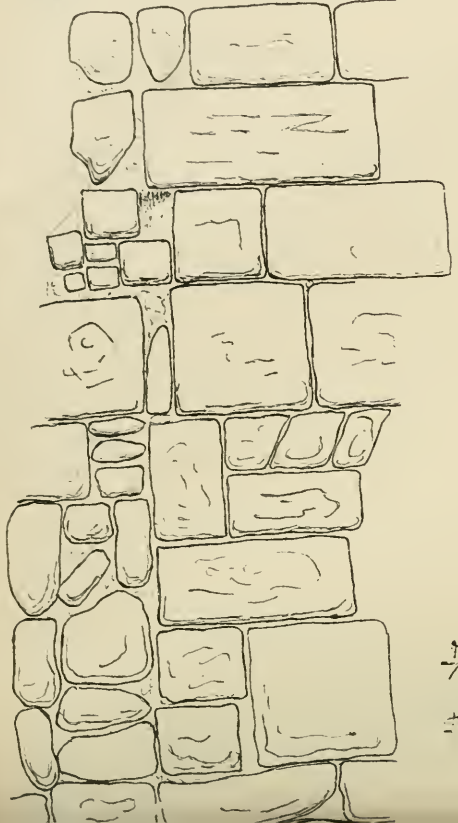
A second entrance to Tower III was found in the north wall of the fortress, but blocked up with masonry. Its level is $8\frac{1}{2}$ inches lower than the door-sill of the other entrance. An entrance to Tower I was also found, its door-sill being about 1 foot higher than the west entrance to Tower III. No offset was discovered along the interior of this north wall though a length of 30 feet was cleared to the rock. The offset in the west wall, which extends as far as the point where Tower IV is let in, was not found in this wall beyond the south end of the tower. The north wall runs back of the west wall, without bond, but it should be remembered that at this point the former serves as the back wall of Tower III which was let in at a later period. We have stated before that the main walls are laid in mud; further examination has shown that the mud contains an admixture of straw, but no lime. This mud was found both above and below the offset, as well as in the back walls of Towers III and IV. As argued before, the entrance to the fortress was probably in the south wall, but this is so ruined that all traces of a doorway have been lost. We sank a shaft to the rock at a point near the south edge of the tell opposite to the central point of the south wall, in the hopes of finding a stairway or some indications of approach, but with no success.

LL ZAKARÎYA: SECTIONS OF EXPLORED AREA IN THE FORTRESS



F. J. Bliss

TELL ZAKARÎYA EXCAVATION
MASONRY AT THE JUNCTIONS OF
TOWER IV AND THE MAIN WALL



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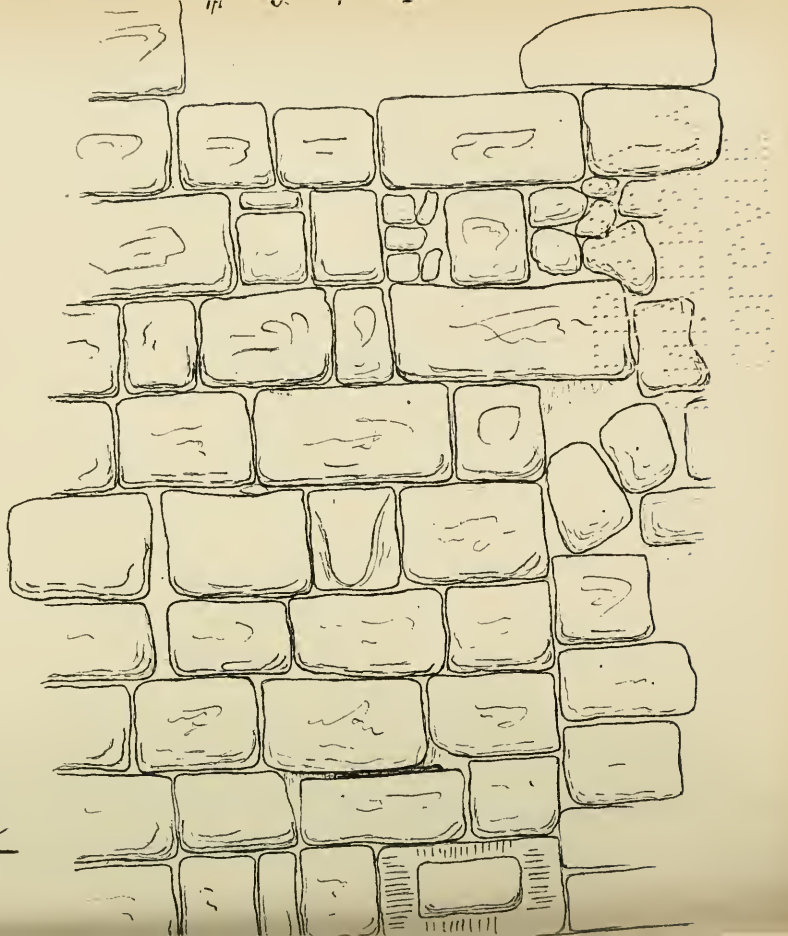


The east side of the fortress has no central tower, but 33 feet north of Tower VI the wall runs out at right angles for 17 feet, and, turning again, runs straight to Tower I. South of this bend, eastwards, the wall was exposed to its foundations for a length of 20 feet, along the inside face, and it was found standing to a height of 18 feet. Section EF (Plate II), looking west, shows that the corner rests upon about 5 feet of *débris*, but further south it is founded on the rock. The building (hatched on plan) which occurs just outside of Tower I, and whose south wall appears on plan to be let in to the east wall of the fortress, is a puzzle. It does not rest on the rock. It was excavated as far as practicable, in order to ascertain its relation to the fortress, but the masonry of both is so rude that it is difficult to come to any decision. After balancing the arguments as to priority, we are inclined to regard the hatched building as the older structure ; in this case the upper wall of the later fortress was carried over the ruined foundations of its south wall. There are no data for determining the use or the age of the isolated mass of masonry outside of Tower I. Built into it is a fragment of a door-sill containing a socket, which indicates the former existence of some large gateway at some part of the tell. Outside of Towers III and V are rude walls, just under the surface, clearly late, as their foundations are only 3 or 4 feet deep, and rest on some 15 feet of *débris*.

We now turn to the interior of the fortress, about one-half of whose area was excavated. Some of the walls were left standing, and in the cases where these were not founded on the rock the piles of earth left as a support were necessarily unexamined. At one point a large cleft in the rock filled with boulders and stones was not cleared out, and two cisterns were not emptied of all their *débris*. Otherwise the rock was entirely laid bare over the whole excavated area. The depth of soil ranged from 14 to 24 feet, the average accumulation being about 18 feet. Some 175,000 cubic feet of soil were thus examined. On the plan the two areas excavated are enclosed by thick black lines. One area—which we will call the west clearance pit—extends southward from the north wall of the fortress, between Towers III and IV. The other—or eastern

clearance pit—is more in the centre of the building, and extends towards the east wall, part of which was excavated to its foundations. This portion was excavated first, and afterwards a pier of earth was left for safety between it and the western clearance pit.

The chief difficulty in the making of these large clearances lay in the disposition of the *débris*. At Tell-el-Hesy, where I cut down one-third of the mound, the earth was cast over the sides, and at the close of the excavations the arable area of the mound was even greater than when I began operations, only it was at two levels, the lower level being the easier of access. Hence the landowner had nothing to complain of. At Tell Zakarîya, where our clearances were inside the fortress, the problem was quite different. Our only chance to make extensive excavations lay in the promise to restore the soil to the *status quo*. Our first clearance was laid out in a square of 80 feet. This was worked in four sections, each 80 feet by 20. Each section was divided into 16 squares, with a digger accompanied by a man and two boys or girls in each square. The earth from the first section was carried in baskets by the children and piled to the north and south. At first the work went on rapidly, but as the section deepened, involving the use of cranes and gangways, and as the piles of earth grew higher, the progress was slow, but the lower we got the more precious grew the *débris*, and the delay allowed the men in the pit greater leisure to examine the soil. When the first section was cleared to the rock and all the remains planned, a stout retaining wall was built along the side facing the next section, so that the earth from the latter might be cast back into the former. This process was continued in the other sections. Sometimes the beginning of a new section was delayed by our discovering in the section just completed a souterrain which called for clearance. The carrying to the surface of quantities of stones, some scattered in the *débris*, others from walls which we were obliged to pull to pieces, after they were planned, in order to get at the layers of earth below, formed no easy feature of the work.

Our observations of the pottery excavated in the first half

of the east clearance pit led us to infer three strata of *débris* (see *Quarterly Statement* for January, p. 21): an archaic stratum on the rock, slightly disturbed in pre-Roman times; a stratum much disturbed in pre-Roman times but probably after the archaic period; a stratum disturbed in Roman times. Our more extensive operations have in the main justified this theory of stratification, though some modifications have been necessary. Thus, the lowest, or archaic stratum, which was said to contain mainly pre-Israelite native ware, with some Phœnician types and a very slight admixture of Jewish stuff, and which appeared at first to be only 4 feet thick, has been found in other places to be 10 feet thick, notably near the north wall, where the archaic types are unmixed with later ware. The highest stratum was said to contain mainly Jewish and Phœnician types, with a slight admixture of archaic stuff and 2 or 3 per cent. of Roman fragments. In the western clearance pit, along the north wall—140 feet in length and averaging 35 feet in breadth—Roman ware was entirely absent from this upper stratum, which differed from the so-called second stratum only in the fact that the latter contained more archaic types. Taking the two clearance pits together it would be better to speak of two strata: an archaic or pre-Israelite stratum on the rock, slightly disturbed in Jewish times, and a second stratum containing mainly Jewish types, but mixed with older styles, and near the surface in some parts only 2 or 3 per cent. of Roman ware. The finding of some of the oldest types of pottery, as well as other early objects, in the upper stratum, is easily explained when we remember that a considerable amount of earth from the lowest stratum must have been cast up when trenches were dug in it for the foundations of the fortress.

The levels of the foundations of the walls unearthed are indicated on the plan by a difference of hatching: those founded on the rock or within 3 feet thereof are cross-hatched, those founded on *débris* from 3 to 10 feet from the rock are hatched to the right, and those founded on *débris* over 10 feet from the rock are hatched to the left. This hatching does not always indicate the relative age of a building. The fact that a wall is on the rock does not necessarily relegate it to the earliest

period, as its foundations might have been sunk through *débris*. However, the greater the accumulation of *débris* under the foundations of a wall, the later that wall should be placed. Thus all the walls hatched to the left must belong to a late period. Where walls are associated with a flooring, the level of the latter indicates the real ground-level of the building, and helps to determine its relative age. The heights at which the vats and pit-ovens occur also furnish an indication of archæological level. In a series of occupations, during which the building material was chiefly stone, it is impossible to assign each building to a particular period, or to count the exact number of periods, as we were able to do at Tell-el-Hesy, where mud-brick tower rose directly above the ruins of mud-brick tower, and where ground-plans of parts of each tower could be made. However, a study of the plan and sections at Tell Zakarîya will show that there must have been at least four mutually excluding occupations. Three section lines have been taken through the east clearance pit; sections AB and EF are drawn to face both east and west, making five sections in all. In the sections the remains of the various constructions are shown *in situ*, the earth in which they were bedded being treated as though transparent. For the sake of clearness, however, and in order to avoid unnecessary repetition, the area included in each section is bounded by the next section line. Thus in section EF (Plate II), looking west, no walls are shown beyond CD; the next in that direction, section AB, facing east, is of a different character, its purpose being to show the nature and stratification of the soil. Here the wall of earth which formed the east boundary of the first quarter of this clearance pit before the second was worked, and which lay a little to the east of the section line, is shown in elevation, and bounds the area of vision. Section EF, looking east, includes the thin walls butting against the fortress wall, although the excavation here was not completed to the rock.

We may now refer to the various constructions in detail. Wall No. 1 blocks up the doorway to Tower IV, and hence must have been built after that tower, which is itself later than the main walls of the fortress. Its foundations are 11 feet

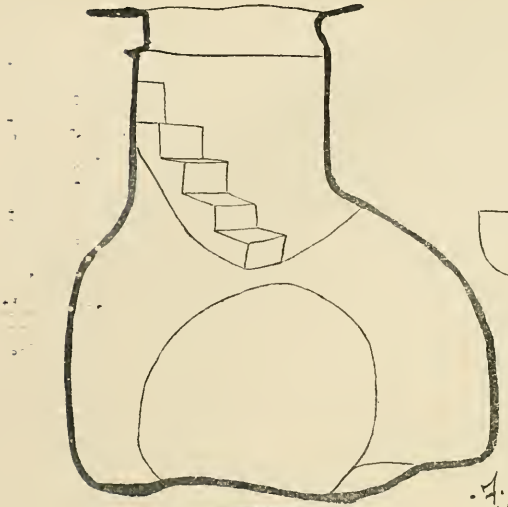
above the rock, and its ruined top was found almost immediately below the surface. Three courses stand, consisting of well-squared stones laid in mud (mixed with straw), very widely jointed and roughly dressed. The lowest course is 1 foot 10 inches high, above which, on the south side, is a 7-inch offset. Above this offset the wall is 4 feet 2 inches thick. The two upper courses average 18 inches in height. Part of this wall forms the north wall of a chamber, 13 feet by 11 feet, the west wall of which is formed by the interior wall of Tower IV. The east and south walls of the chamber are of less thickness. The east wall is rather more heterogeneous in style than the north wall. Three courses stand, the lowest containing one top-drafted stone. Two rollers are built in lengthways, the holes for the spindles turned outwards. The south wall of the same chamber is more compactly built; the masonry is smaller, and little field stones are used to fill up corners. One top-drafted stone occurs. There is no bond in any pair of walls of this chamber. Wall No. 2 lies outside the area of the clearance pit, but it was found to rest on the rock, and stands to a great height. It butts against the city wall. It does not differ materially in construction from wall No. 1. The two cross walls immediately to the north also butt against the city wall. Both rest on *débris*, but the foundations of the southernmost one are 5 feet deeper than those of the other.

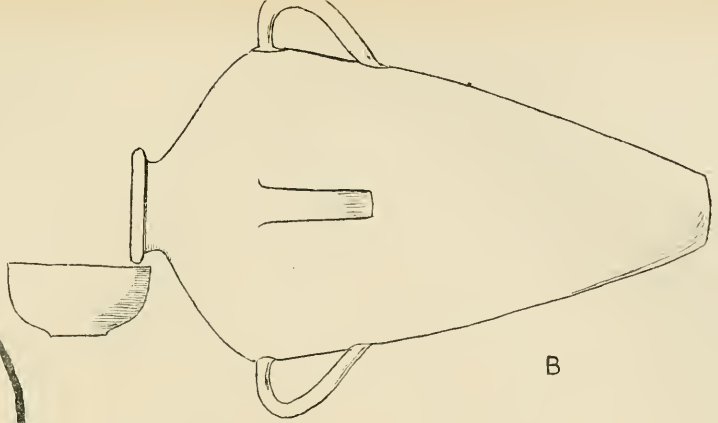
In the vicinity of wall No. 3 we have distinct indications of four periods. Immediately above the rock we found a portion of a very rude mud flooring *in situ*, covered with earth to the height of a few inches, containing stamped jar-handles with winged figures similar to the types found at Jerusalem by Warren, near the rock at the south-east angle of the Haram. Above this occurred a mud flooring, somewhat less rude, broken but *in situ*, on which was a burned layer containing stamped jar-handles with winged creatures similar to the type figured on p. 104 of the April *Quarterly*. The foundations of wall No. 3 are 2 feet 3 inches higher than the level of the second flooring, and thus must belong to a later building. The foundations of the wall running obliquely to the west are 3 feet 9 inches higher than those of wall No. 3; it may, however, be no later,

but it is certainly later than the second flooring, and is earlier than wall No. 1, which was found broken off at the point where it once ran over the oblique wall, the level of its foundations being 5 feet 4 inches higher than those of the latter. This brings the distinct number of periods up to four. Both wall No. 3 and the oblique wall are of small, uncoursed rubble. The slight wall which appears on plan to be against wall No. 1 consists of one course of rubble, the foundations of which are 5 feet 6 inches lower.

No. 4 is a flooring of grey mud, some 10 feet below the surface and 6 feet above the rock. It is broken along three edges, hence, as in the case of the other floorings found, its former extent cannot be determined; but it probably was co-extensive with the rude rubble wall, 3 feet thick, against which it terminates at the north. In the centre was sunk a stone vat, shaped like a bowl, 7 feet 7 inches in circumference, the bowl being 1 foot deep. The curved wall in the corner probably represented a fire-place; the floor here consisted of mud of a reddish colour. Wall No. 5 consists of rude rubble badly coursed. It was founded on the rock, and partly blocks up the entrance to a souterrain. The walls at right angles are founded on *débris*, and may or may not have made use of wall No. 5 in forming a chamber. A plan of the souterrain is submitted (Plate IV). This is No. II in the series of rock-cuttings described by Mr. Macalister in the January *Quarterly*. It is approached by an oblique shaft with five rock-cut steps descending to within about 6 feet of the bottom of an oval chamber. We cleared this of its *débris*, in which was found buried on its side a large Phœnician jar, with a bowl placed near the mouth. A number of large flat stone discs were also found.

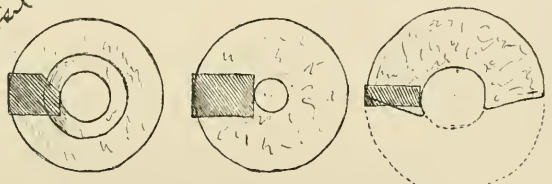
No. 6 is the largest piece of wall found within the fortress; it appears on the south side of the vaulted cistern (over which it probably ran), where it is broken off, and it extends into the west clearance pit, where it turns at right angles, forming a distinct corner. At this point it runs over another wall, which extends north. The length traced thus was about 75 feet; it is $3\frac{1}{2}$ feet thick. Its outside face is towards the



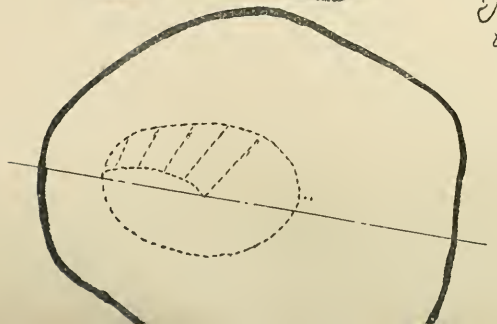


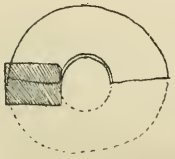
B

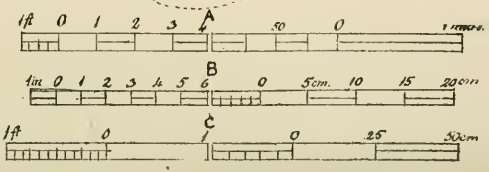
F. J. Bliss.
PASTward Excavations



STONE DISCS







north and consists for the main part of irregular, roughly-squared stones, from 1 foot to 2 feet 3 inches in length, built in courses 1 foot 4 inches high. From two to three courses remain, laid in mud mixed with straw. The masonry is merely quarry-dressed, but at the south end are fine stones in which a continuous chamfer—or draft line—is carried 3 inches deep along the tops, amounting to little more than a smoothing off of the surface. The maximum set-back is about 1 inch. They probably represent the characteristic work of this building, of which hardly more than the foundations remain, resting on over 10 feet of *débris*. The pit-ovens, shown on section AB, facing west, may belong to a room of this building. Such ovens were found in the higher levels at Tell-el-Hesy, and are used to-day in Syria. A hole is dug in the ground, some 3 or 4 feet deep, the sides are plastered with mud, with or without straw, sometimes laid on in rings, in some cases the bottom being also plastered; a fire of twigs is kindled at the bottom, and when these are reduced to coals and ashes the dough, flattened out, is stuck on the sides of the oven and thus baked. Thus the base of a pit-oven *in situ* may be taken as representing a level 3 or 4 feet below the ground level of the period at a given place. The wall running from under the corner of the wall just described to the fortress wall consists of random rubble. A fragment of a plaster flooring was observed along this wall at the level of its top. Beyond the edge of the wall the plaster sloped upwards (resting against *débris*) at an angle of about 110 degrees. The purpose is not clear. The pit-ovens to the north of these walls are shown by their levels to belong to an earlier period. Near the cistern, in the same vicinity, was discovered a stone trough. This cistern was not entirely cleared out; it has a cylindrical shaft, 6 feet in diameter to a depth of about 6 feet, where it expands into a bell shape. The sides are plastered.

The vaulted cistern over which wall No. 6 runs is partly excavated in the rock, having four rock-hewn steps, leading from east to west. Similar stepped cisterns were seen by me at Jerusalem. The rock was plastered in two coats. Above the rock-cut portion masonry walls rise, also plastered,

terminating in a circular vault. The rock-cut part of the cistern may go back to the earliest period, but the vaulted portion must have been underground at the time it was used, and hence is relegated to the period of the long wall running above it. The pottery found in the cistern was later than that in the *débris* banked up outside its walls. This cistern forms part of a series of waterworks. To the north is a cistern, cut in the rock, approached by a shaft, partly masonry and partly rock-hewn. The built part reaches nearly to the present surface, hence this cistern must have been used in the latest period. Its dimensions are about 18 feet long by 14 broad, and it is also stepped down. At the south end it was once connected with the vaulted cistern by a hole cut in the rock, which in later times had been filled up with masonry. A section taken through these two cisterns (unpublished) shows a fall of a few inches from the bottom step of the vaulted cistern to the top step of the other, giving a continuous series of steps. The latter cistern had been plastered after the connection was closed. A number of distinct water-lines run around the walls. To the south of the vaulted cistern is another stepped cistern, the steps running at about right angles to those of the former. Above the rock-hewn part they have a wall in common. To the south of these waterworks is a series of large stone vats for the making of wine or treacle. They are *in situ*, and belong to the middle period of the tell. Sections will be published later.

No. 7 is curious, as it consists merely of a shaft 4 to 5 feet in diameter and 10 feet deep. It is possible that it was merely a trial shaft for a cistern which was not completed owing to the softness of the rock or for some reason unknown; or it may be a corn-pit. The plaster floor, No. 8, is shown by section EF, looking west, to be older than the wall, which is broken off only 4 feet from it, and which probably once ran over it. The centre of the same section shows a clear indication of three periods. First we have the wall on the rock; then, 8 feet above, the room with mud flooring, with one wall *in situ*; and then, 5 feet above this, in the immediate vicinity, the base of a pit-oven, which must have been sunk in the *débris*, burying the

room with the flooring. In this flooring was a circular depression which may once have contained a vat similar to those in floorings Nos. 4 and 11. The cleft in the rock is marked, because we found cast down into it great quantities of pre-Israelite potsherds, with some whole vases. Cistern No. 10 was not fully excavated, as it seems to have been filled up in the latest times, a few fragments of Roman ware appearing in it. It is approached by a square shaft 11 feet deep and 6 to 7 feet across. As far as excavated the body of the cistern measured 14 feet by 10, but it showed signs of widening out. The walls are plastered, and have a distinct water-line a little below the base of the shaft. The semicircle marked corn-pit is part of a circular cutting in the earth for storing corn; grains of barley were actually found adhering to its sides. These corn-pits were a feature of the higher cities at Tell-el-Hesy. They were easily detected by the fact that the soil filling them up differed from the soil in which they had been excavated.

The broken flooring, No. 11, was found *in situ*, and extends over an area measuring 10 feet by 15. It is made of mud and ashes grouted in small pebbles, and is about 3 inches thick. The surface is uneven. Immediately below is a second flooring of similar construction. We have here clear signs of a room whose flooring has undergone repair. In the centre is a bowl-shaped vat of stone, having its top edges flush with the upper flooring, and projecting 3 inches above the lower flooring in which it is also sunk. It measures about 1 foot 9 inches in diameter over all, its sides are about 3 inches thick, and the depth of the bowl is 1 foot 3 inches. We have mentioned a similar vat in flooring No. 4, which has the same archæological level. At the north end of No. 11 a cubical block of stone was found sunk down into both floorings, projecting 8 inches above the level of the higher. It measures 17 inches long by 14 inches broad. This may be a household altar, or, perhaps, merely a seat. Section EF, looking east, shows indications of three periods in the construction. The steps leading down to the mouth of cave No. 13 are older than the wall above, against which a vat is placed, and this wall and vat are plainly older than the room above, which contains a pit-oven. The rock

cutting No. 14 is curious. It consists merely of an oblique shaft, stepped down to the bottom, which is of very soft limestone. A small segment of its circular flooring was found broken, showing earth below. We cut out the whole, finding 7 inches below its surface a cave or cistern (plastered at top) filled with *débris* and pottery similar to that found in the excavated portion of the neighbouring cistern, No. 10, which, as we have stated, was only partially excavated. The pottery included one piece of Roman ware of which cistern No. 10 showed examples. The sides of the shaft are covered with a thin coat of plaster. It appears that the makers of this shaft, No. 14, abandoned their work on breaking into cistern No. 10. No. 13 is an artificial entrance, with one worked step, leading into a large natural cave, the top of which is broken, having a cleft in the rock, filled with boulders and stones, which we did not clear out. Section EF, looking east, shows a portion of the inner face of the fortress wall, with the corner where it runs out east. The foundations of this corner are very bad and rest upon about 5 feet of *débris*, though 20 feet to the south this same wall rests on the rock.

We may now sum up the results of our excavations within the fortress. We have proved that the fortress was built after a considerable amount of *débris* had accumulated on the mound, perhaps in the Jewish period. It was not divided into chambers, but was simply a large enclosure for protecting houses within. These houses belong to at least four periods. From the constructions unearthed and from the objects discovered we know how the inhabitants reaped their crops, ground their grain, baked their bread, stored their water, made their wine and treacle. The dateable objects range from pre-Israelite to late Jewish times, with a very small proportion of later objects. It appears, accordingly, that the place was inhabited when Joshua conquered the land, that it was fortified in Jewish times, that it was occupied till a late Jewish period, and that during the Roman period there was a brief occupation, after which it appears to have been deserted.

The finds of the season consist of objects in stone, bronze, iron, clay, paste, and glass. In stone we have a large quantity

of flints (both knives and sickle flints), corn-rubbers, weights, rollers, catapult balls, &c. Two of the weights bear the inscription נצף, which was found on the weight figured on Plate 7 of the April *Quarterly*. That specimen weighs exactly 10·21 grammes. The two specimens found this season weigh about 9 and 9·5 grammes respectively. One is of white limestone, the other of a stone of light reddish colour. All three were found within 5 or 6 feet of the surface. The stone cylinders will be described later. In bone we have the usual prickers, spindle-whorls, and carding tools, such as have been drawn before. In bronze, spatulas, arrow-heads, needles, a ring, three coins, spear heads, a chisel, a vase handle, &c. The iron objects (which did not extend down to the rock) include

Inscribed Weight from Tell Zakarîya.

nails, clamps, and arrow heads. In brick, a number of weights turned up. A few fragments of glass vases and some glass beads were found. The pottery has been described in general above. The patterns found on the roughly-painted archaic ware are all being drawn by Mr. Macalister, and will make several interesting sheets. Some Phœnician and Aryan ware occurred; the latter must have been imported. A child's rattle, like one found by me at Tell-el-Hesy, was discovered. At one point within the fortress, 12 feet from the surface, and $2\frac{1}{2}$ feet below the foundations of rude walls, we found a group of buried Phœnician vessels. First we have a bowl in which a lamp was placed; the lamp was filled with soft earth and ashes, firmly packed; over the lamp was placed an inverted bowl, and a third bowl, also inverted, was fitted on to this, with a thin layer of earth between.

At Tell-el-Hesy jar burials occurred in a sandbank far outside the city limits, as well as inside the city, where they were usually found near the bases of walls, from which I gathered that they might refer to some ceremony connected with house dedication. The jars usually contain nothing but earth and ashes, though in a few cases animal bones have been found. Mr. J. G. Frazer, of Trinity College, Cambridge, suggests that we may have in these jar burials an example of the widespread custom of going through a form of burial in the cases of persons whose bodies could not be obtained, as it was supposed that without the performance of funeral rites the soul could not find rest, and would trouble the survivors.

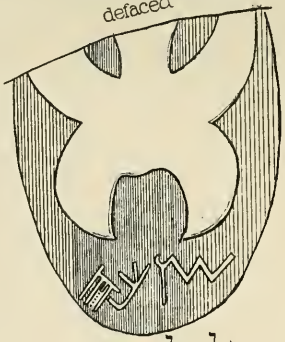
On p. 104 of the April *Quarterly* was figured a stamped jar-handle, showing a four-winged creature with the inscription, למלך חברן. It was shown that this differed from the handles with royal stamps found by Sir Charles Warren at Jerusalem. This last season we have found at Tell Zakarîya 12 royal jar-handles, nine of which are drawn on Plate V. All the handles are moulded with two ribs, running up and down, as seen in the section on Plate VI, where the ribbing is drawn in its most pronounced form. Usually the depression between the ribs is slight. In cases where the stamp was carelessly used these ribs prevent the whole inscription from appearing. The stamps on six out of the nine handles drawn are of the type figured in the last *Quarterly;* the remaining three belong to the type found at Jerusalem. In the former type we have a creature with four wings curving diagonally with reference to the body, with a wedge-shaped head, and with a slight projection of the body in a zigzag below the two lower wings. The latter type seems to me to show a creature with two wings only, running at right angles to the body, with the wedge-shaped head of the former type, and with the lower part of the body more fully developed, Mr. Macalister suggests that the creature represented is a butterfly, which is treated in a more natural manner in Figs. 1 to 6, and is conventionalised in Figs. 7 to 9. He therefore argues that the Jerusalem type is a development of the other.

It should be remembered, however, that these specimens of

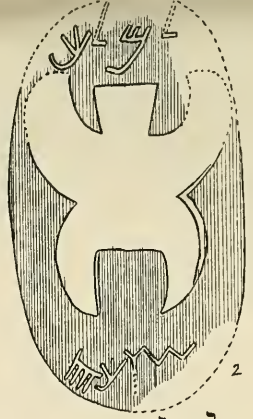
½ inch

1 centimètre

defaced



(למלך)שוכה



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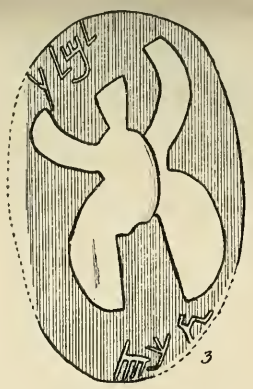

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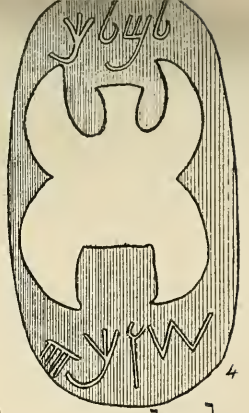

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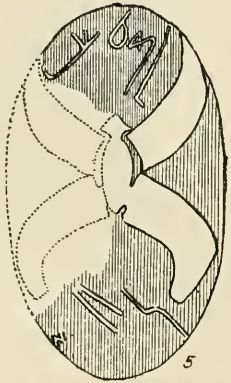
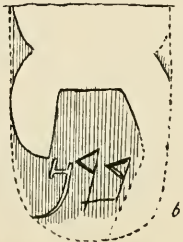
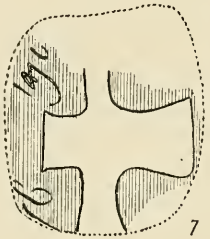
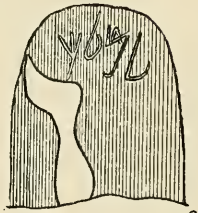
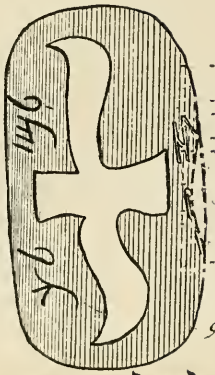








למלך ***



F. J. Bliss.

the Jerusalem type were found in a few inches of *débris* upon a pavement, and that above this occurred another pavement, upon which were three specimens of the supposed earlier type. Nos. 1–4 all bear the name שבוה below the figure, and three of them have למלך above. In the fourth (No. 1) the upper words are quite defaced: "Belonging to the king of Shocoh" is the translation. Shocoh is now represented by the ruins of Shuweikeh, some 3 miles east of Tell Zakarîya. Shocoh is mentioned among the towns included in the inheritance of Judah (Josh. xv, 35); it was under the jurisdiction of one of Solomon's 12 generals (1 Kings iv, 10), and it was invaded by the Philistines in their campaign against Ahaz (2 Chron. xxviii, 18). Hence it certainly belonged to the Hebrews, though it is not mentioned in the list of royal cities in Josh. xii. In all these four specimens the joining of the ש and ו in the lower, and the four side strokes of the final ה should be noticed. The absence of the third prong in the final ך in the upper line of No. 3 is shown by an examination of the handle to be due to carelessness in stamping. In No. 5 the place name has been worn almost entirely away.

Many hours of microscopic inspection have failed to give us the clue to the letters of the defaced word. In the fragment No. 6 the place name is evidently Hebron, for though the first letter does not appear, owing to careless stamping, the three last letters ברן are perfectly clear. In No. 7 only the line למלך appears. The mark like an apostrophe after the מ might be taken as accidental, did it not appear more prominently at the corresponding point in No. 9. Mr. Macalister suggests that it may stand in place of a hyphen. The mark under the first ל of No. 13 is quite as distinct as the rest of the inscription, though its significance is not clear. In fragment No. 8 we have only the upper line. The place name of No. 10 shows the first letter ז complete, and the upper parts of two other letters, which may be י and ף respectively, giving למלך זיף (belonging to the King of Ziph) as the reading. Of the three specimens not drawn, one is of the type of Nos. 7–9. It is faintly stamped, only the first two

letters of the לְמֶלֶךְ occur; below, parts of three letters appear, followed by the space for a fourth. The first is certainly a ח, the other two might be ב and ר respectively; accordingly we probably have another king of Hebron stamp, this time with a creature of the two-winged type. The other two undrawn specimens are of the four-winged type. One shows part of the upper line, while the place name is illegible, though it appears to be the same stamp as No. 5. The other is much disintegrated: only the last part of the lower line appears, showing distinct traces of two letters, most probably מ and ש respectively. Before the מ indications of the tail of a כ or a נ (caph or a nun) appear, but the space between this letter and the right margin of the stamp hardly admits of the insertion of another letter, thus seeming to rule out Michmash (מכמש) as a reconstruction. Our discovery of jar-handles inscribed "To the King of Shocoh," as well as of jar-handles with figures of the Jerusalem type inscribed with place names, proves not only that the word Hebron on the jar-handles refers to the city of that name, but that the handles found at Jerusalem inscribed L^{e}M^{e}L^{e}K Z^{e}PH^{a} and L^{e}M^{e}L^{e}K SH^{a}T refer to places, not persons as assumed before.[1]

On Plate VI are shown potters' marks found on jar-handles of similar ware. The horse on No. 1 shows considerable spirit; the legs are in action and the hoofs well-marked. No. 2 has an Egyptian-like figure bearing a staff. Most of the rest are beautifully formed rosettes of various types developed from flowers. No two of the same type were found, with the exception of No. 10, of which several specimens occurred. It may be mentioned that the shading on these stamps, as well as that on Plate V, has been employed merely to bring the stamps into better relief.

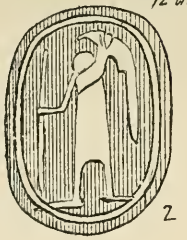
Plate VII shows scarabs, cylinders, and seals. Scarab No. 1 is of paste, purple enamelled. No. 2 is of slate. No. 3 is either slate or hard paste, grey enamelled. Nos. 4, 6, and 7 are paste, bluish-green enamelled. The back of No. 7 has the form of the eye of Horus. No. 5 is bone. No. 8 is paste, blue enamelled. No. 9 is a finger-ring of paste, purple enamelled. Nos. 10 to

[1] *See* "Recovery of Jerusalem," p. 473 *ad seq.*

½ inch

1 cm.


1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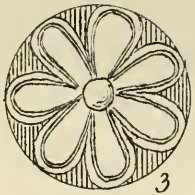
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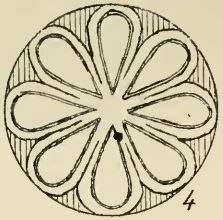
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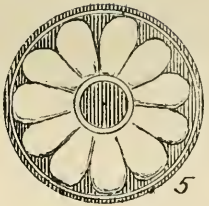
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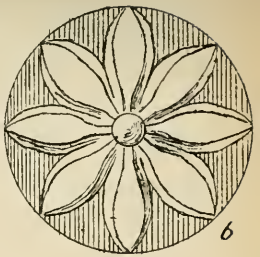
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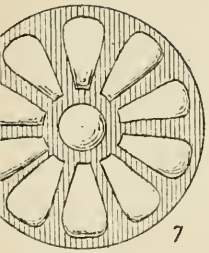
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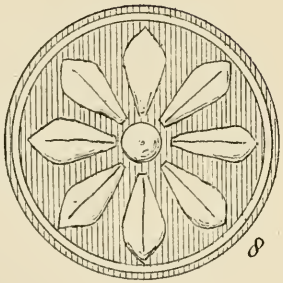
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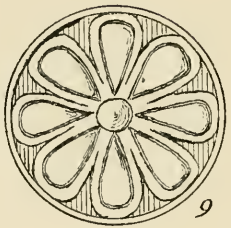
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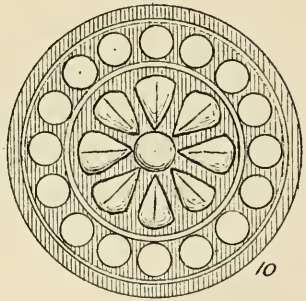
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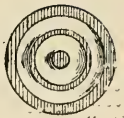
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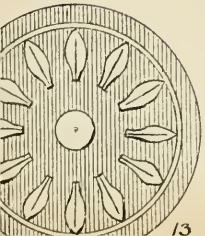
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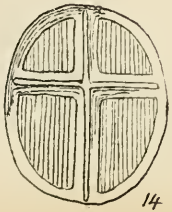
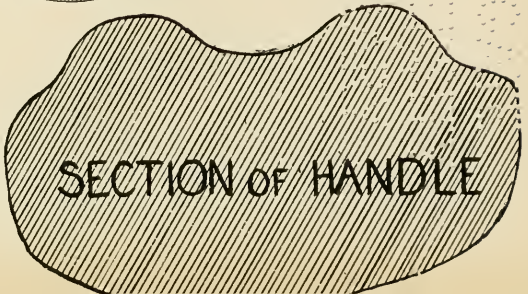

14

T. J. Bliss.

R. A. Brock Typewriter



TELL ZAKARÎYA:

SCARABÆI, SEALS, AND CYLINDERS.

½ in.

1 centimètre

I

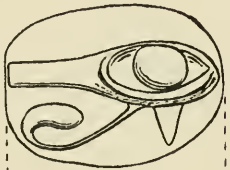
II

III

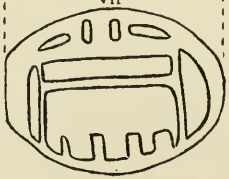
IV

V

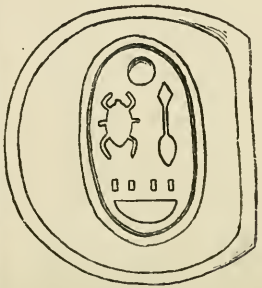
VI



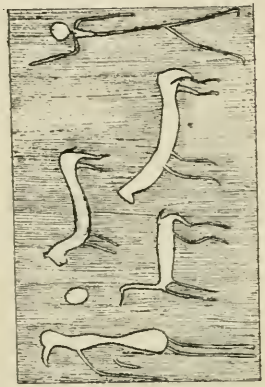
VII



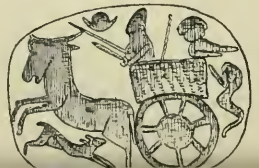
VIII

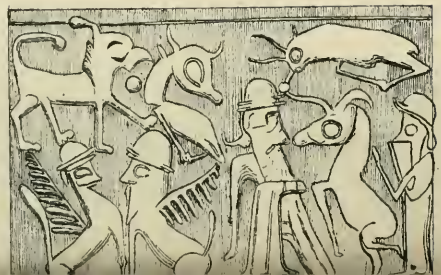


IX



X.





XII

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12 are probably Babylonian. No. 10 is a cylinder of hard black stone; the carving is very rude, and appears to represent a man driving animals. No. 11 is an amulet of the scaraboid form made of blue glass. It represents a lion hunt, and bears a two-wheeled chariot containing two men. The cylinder, No. 12, is of soft white limestone. It was found almost immediately under the surface.

The extraordinary series of chambers (marked XXI in the catalogue of rock cuttings of Tell Zakarîya, *see* January *Quarterly*, p. 32) has been thoroughly explored by Mr. Macalister, who found at different levels 49 chambers, connected by shafts and creep-passages. His elaborate plans and sections will be published later. The difficulty of the work was enormous, owing to the lack of good air, the narrowness of the passages, the accumulation of *débris*, &c. He pursued his task with enthusiasm, and the results are well worth the labour involved.

Our work this season at Tell Zakarîya began March 20th, and lasted till April 22nd. Eleven days were lost to the work owing to unfavourable weather and to the great Moslem Feast. We were honoured by a visit from Sir Charles Wilson, who not only saw the progress of the work at Tell Zakarîya, but rode with me to inspect Tell-es-Sâfi. Our other visitors included the learned epigraphist, the Père Germer Durand; the director of the railway, who brought a party by special train to Deir Aban; the Rev. Dr. Nies, of America, who took a keen interest in all the details of the work; and an American soldier on his way back from Manila. Our arrival was honoured by a series of dinner parties given to us by the chief men of the village. On leaving for Tell-es-Sâfi we returned their hospitality in a lump, and an orderly crowd of some 80 people assembled in circles under the olive trees and partook of roast lamb, rice, and other simple fare. The friendly feelings of the villagers were very gratifying, and many have followed us to Tell-es-Sâfi.

TELL-ES-SÂFI, *June 6th*, 1899.

FIRST REPORT ON THE EXCAVATIONS AT TELL-ES-SÂFI.

By F. J. Bliss, Ph.D.

Though the present permit, dating from October 1st, 1898, was obtained chiefly with the intention of excavating at Tell-es-Sâfi, work was not begun there till about five weeks ago. For various reasons it was thought wiser to start operations at Tell Zakarîya, which is also within our area. That site proved to be so promising that, after the winter's break, we returned to continue the examination of the fortress crowning its summit. By April 22nd we had reached a convenient halting point, and closed the work, though it is possible that we may return to examine the lower plateau, where we have reason to suppose that the *débris* is not so disturbed as it is within the fortress. On Monday, April 24th, we moved to Tell-es-Sâfi, hoping to begin digging at once; but delay was occasioned by the indisposition of three of the party, by the occurrence of the Neby Mûsa Feast, as well as through a slight difficulty in making the people understand the reasons for our descent upon their Tell. However, all obstacles being overcome, we began our shafts on May 4th, and have continued without a day's interruption till the present day. The weather has been extraordinarily cool, north and west winds prevailing. The harvest used to interrupt our work at Tell-el-Hesy in May, so here before the barley was ready to be reaped we employed over 100 people a day, in order to have as large a remnant as possible after the harvest set in. At first the workmen were from both Zakarîya and from Tell-es-Sâfi, but after the harvest was in full swing the local people all left, while we have retained about 50 of our trained labourers. Many of these sleep in a large tent on the edge of the camp, and thus furnish protection by night as well as labour by day. They bake their bread upon coals and ashes on the ground, making picturesque groups around their camp-fire. One night they got up a *Fantasîya*, with dancing and singing and firing of guns. For

our own comfort in the heat of the day we have erected a booth of poles and branches of the *Kharrûb*—a great improvement in summer upon canvas. We are most fortunate in striking a season when the stream-bed is dry, for it usually is full of stagnant water, producing malaria, which has given Tell-es-Sâfi an evil reputation in the whole district. Signs of the disease are visible in the inhabitants, whose listless appearance is in striking contrast to their more vigorous neighbours of Zakarîya. Even in this off season we are constantly asked for quinine. Our camp, pitched on the col to the south of the tell, is open to all the breezes, and since work was started the health of the party has been excellent. The undeveloped state of the operations begun here, and the necessity of bringing the Tell Zakarîya work up to date, while at the same time we have been pushing the excavations at full speed, have combined to prevent our preparing a full account of all that has been accomplished; hence the present report is merely a general summary.

The importance of the site of Tell-es-Sâfi has always been recognised by archæologists. It is a striking point in the landscape from whatever direction it may be approached. The Vale of Elah, coming westwards through the low hills of the Shephelah, sweeps around its north side and at once enters the Philistine plain. Tell-es-Sâfi thus stands as a natural fortress between this plain and the rolling country. The view is magnificent. To the north appears the town of Ramleh, with its tower; to the east is the olive-dotted Shephelah, bounded by the Judean Mountains, and crossed by the lower ridge running from Tell-ej-Judeideh to Tell Zakarîya; to the west lies the broad expanse of the maritime plain, with the sites of Ashdod and Ascalon quite distinct. The Wely—dedicated to the Khŭdr—stands in the highest part of the Tell, *i.e.*, the south end, 300 feet above the well in the river bed. From the river bed the ground slopes up gradually to the base of cliffs of white limestone—in places bare, in others covered with weeds—which rise sometimes almost sheer to a height ranging from 100 to 150 feet. From the top of the cliffs the ground rises rapidly to the Wely. The summit of the Tell does not show the flat surface of Tell Zakarîya. The ground near the grave-

yard surrounding the Wely is irregular and broken up by rubbish heaps. Beyond this it slopes down gradually north and north-east to the narrow plateau whose top is fairly level. The fall from the summit on the east side is at first rapid, and then more gradual; on the south the tell is joined to a ridge by a saddle some 100 feet below the summit.

The lofty south end must always have been the Acropolis. The mounds of rubbish represent the ruins of the Crusading fortress of Blanche-Garde, built in 1144 as an outpost of defence, during the war with the people of Ascalon. It fell into the hands of Saladin in 1187. In his book, published in 1872,[1] G. Key gives a sketch plan of the remains of this fortress. The Wely had apparently not been built at the time of his visit. According to him the building was about 60 metres square. At two angles he recognised the remains of towers, one of which appears to be on the site now occupied by the Wely. In 1875 Conder found the Wely, but says[2]:—"Of this fortress nothing remains but the rock-scarps, which are dimly traceable." We have observed the ruined top of a wall of well-squared masonry about 8 feet thick, extending north from under the east wall of the Wely. This is probably a portion of one of Key's towers. The other tower, with the rest of the building, may have been pulled down to form the Wely, the interior of which is lined with drafted stones. These do not show the diagonal chiselling characteristic of the Crusaders, but they may have been taken by them from older buildings. According to the people, the Wely was built some 30 years ago. Burials are constantly occurring on this site and the surface constantly changing. Hence the wall observed by us may have been underground at the time of Conder's visit. Key also observed traces of an outer enclosure. The portion seen by him appears to have disappeared, but the piece of walling now uncovered at X seems to be in line with the former, and may form a part of the same enclosure. To follow

[1] "Études sur les Monuments de l'Architecture Militaire des Croisés en Syrie et dans l'Île de Chypre." Par G. Key. Paris, Imprimerie Nationale. Pp. 123–5.

[2] "Tent Work in Palestine," p. 76. One-volume edition.

up this clue would be almost impossible as the wall X is on the borders of the graveyard.

At several points along the slope of the tell there appear above the surface portions of a massive wall. Following these clues we have traced a large part of the rampart. We thus have, in all probability, the limits of the ancient city, as the rude construction of this rampart and the entire absence of mortar rule out the Crusaders as its builders. This wall follows the natural contours of this hill (whose shape is more or less like the moon in its first quarter) around its east, south, and west sides. On the precipitous north side a wall would appear to have been superfluous. Thus limited by the rampart and by the cliffs, the ancient city crowned the summit of the hill and extended part way down its slopes, having an extreme length of about 400 yards and an extreme breadth of about 200 yards. How little of this space is available for excavation will be seen by a glance at the plan. The south end is largely occupied by the modern graveyard, the modern village rules out the north portion, while another graveyard extends over a great part of the narrow plateau extending to the north-east. We are thus confined to the steep slopes above the wall, to a portion of the north-east plateau, and to a narrow section across the summit, east and west, between the southern graveyard and the modern town. The last portion does not give us a free hand as it is divided into three fields by lofty and dense hedges of cactus, the central field being planted with vegetables. The graveyard at the important south end will, of course, prevent our searching for the ancient Acropolis; but even if the tombs did not exist, the earliest remains could not have been examined here without digging through the foundations of Blanche-Garde.

Our first task was to make trial pits to determine the nature and depth of the accumulation. Three were sunk in a line east and west along the eastern half of the space available on the summit south of the village. In the shaft nearest the eastern slope rock was found at a depth of 41 feet, in the others at 30 feet and 24 feet 6 inches respectively. For the first 5 feet Arab pottery occurred. Below this for 5 feet or

more the ware was of Jewish types. Thence to the rock the fragments were pre-Israelite in character, growing more ancient as we descended. In the shaft nearest the slopes the styles were naturally somewhat mixed in the upper levels, but the lowest 20 feet showed an undisturbed stratum of pre-Israelite ware. In the three shafts sunk on the north-east plateau, rock was found at a depth ranging from 20 feet to 28 feet. The pottery results were practically the same as those from the other trial pits. This plateau accordingly seemed to have been inhabited in the earliest periods and hence called for investigation. Although I was aware that its position did not indicate the most important part of the city, certain practical considerations led me to make the first great clearance here rather than in the centre of the Tell. An area was accordingly marked out, measuring 80 feet north and south, and 90 feet east and west, bounded on the north by the steep slope and having the graveyard to the west and south. The intention was to work this in three sections, each 80 feet by 30 feet, in the manner described in the Tell Zakarîya reports. We have now completed the first section and have deepened the second about halfway to the rock. In the first section rock was found at a depth ranging from 21 feet to 30 feet, the average depth being 26 feet. After a depth of 15 feet the problem of bringing the earth to the surface becomes difficult, and notwithstanding that we left two earth stairways in excavating the western line of the pit and dug two slanting trenches as a means of egress to north and south, the work went very slowly. Moreover, the limitations of space required that most of the earth and stones should be piled in a heap to the west. Hence the boy removing earth from the centre of the pit near the rock had to carry his basket 20 feet to the corner of the pit, then to mount a gangway to the bottom of the earth stairway, then to ascend the stairway to the surface, and finally to climb a huge pile of *débris* before he could empty the basket. Fortunately rock was reached first in the northern half of the pit, hence several feet of *débris* on the rock in the southern half had merely to be shifted to the excavated portion.

The thousands of potsherds exhumed daily were studied

piece by piece, analysed, and a summary of the results noted down. These results justified the conclusions drawn from the trial pits. I recognise four strata of pottery. From the surface to a depth of 7 feet we find a good proportion of Arab glazed ware, sometimes rudely marked with patterns. The other types include the Jewish forms found at Tell Zakarîya (with the exception of the lamps with thick bases), a good deal of early Greek ware (B.C. 700–550), some specimens of Greek black and red ware (550–350), and a few pre-Israelite types. In this stratum were found the foundations of a series of rudely constructed chambers, built in mortar, as well as several fallen voussoirs. The dressed stones all showed signs of the fine diagonal Crusading chiselling. The ruined tops of most of these walls are immediately under the surface. These buildings may have been erected at the time of Blanche-Garde, their foundations being sunk in ancient *débris*. This fact accounts for the mixture of styles in pottery. The ware used by the Crusaders was doubtless the local Arab. From 8 to 10 feet we have the same ware as found in the upper stratum, minus the Arab stuff and with less late Greek. In this stratum two jar-handles with royal stamps occurred—one illegible, the other inscribed: "Belonging to the King of Shocoh." From 9 to 20 feet occur the pre-Israelite types found at Tell Zakarîya, including Phœnician forms. At Tell-es-Şâfi the local painted ware shows a greater variety in patterns and colouring. A sprinkling of Ægean fragments occurs. From 21 feet to the rock the pre-Israelite ware continues, but shows a much greater proportion of the ledge-handles and other types found in the first city at Tell-el-Hesy (dating about 1600–1700 B.C.), but rare at Tell Zakarîya. The paucity of the comb-faced ware, commonly associated with the ledge-handles at Tell-el-Hesy, is noticeable. In this lowest stratum Phœnician ware and the local painted types are absent. We thus have four strata: a pre-Israelite stratum on the rock, older than the lowest stratum at Tell Zakarîya; a later pre-Israelite stratum; a stratum contemporaneous with the Jewish period, and extending into Greek times; and a Crusading stratum. The appearance of archaic ware in the higher levels is explained by a

series of walls found in the Jewish stratum, with foundations extending into the stratum below, whose *débris* was thus disturbed in places brought to the then existing surface. The city walls at the points tested were not found to rest directly on the rock but on the lowest stratum of *débris*. As their massive foundations must have been sunk in a considerable depth of *débris*, it would appear that they were not built much earlier than the Jewish period. Thus, according to the testimony of the pottery, the place appears to have had a continuous history from the eighteenth to the fourth centuries B.C., when it appears to have been abandoned till the period of the Crusaders, whose occupation was brief.

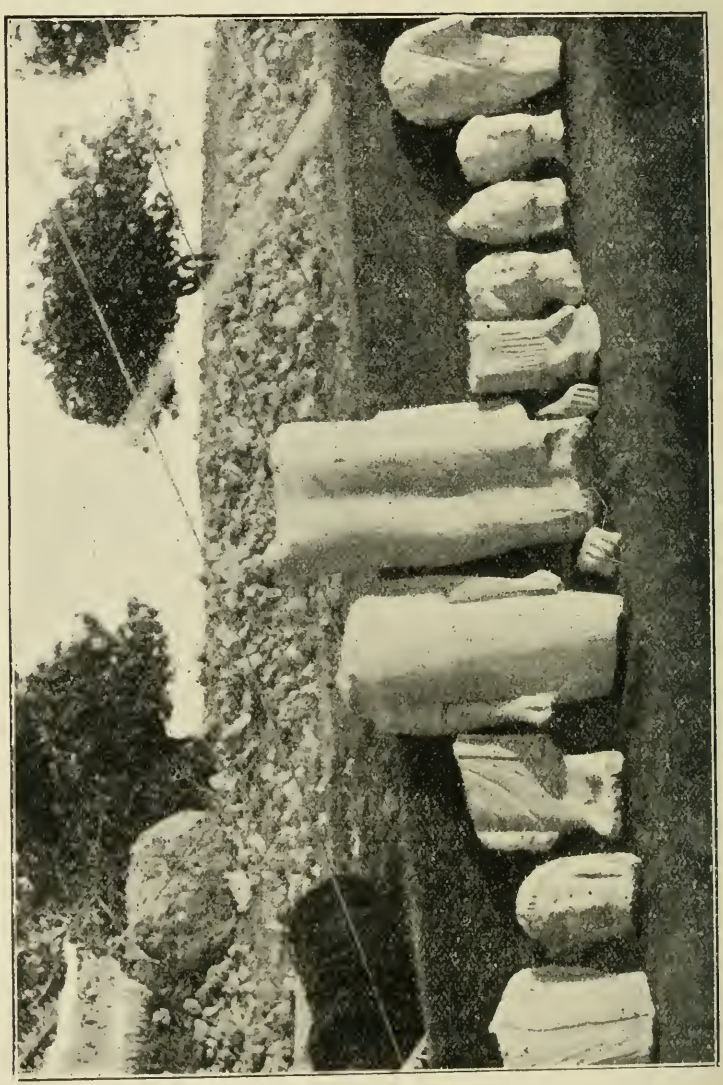
The objects found in this great clearance were of stone, bronze, iron, and paste. The most important of these will be drawn later, and I confine myself now to a general catalogue. In stone: uninscribed weights, catapult balls, a lamp-stand, slate spindle-whorls, beads, a small, rudely-incised cylinder, corn rubbers, &c. In bronze: three coins, spatulas, pins, arrow heads, fragments of vessels, &c. In iron: bolts, pins, arrow heads, spear heads, fragments of knives, a sickle, &c. Hardly any iron was found more than 14 feet below the surface. In paste: many beads, two scarabs, one scaraboid (Babylonian?) representing a man on horseback attacking a lion, three Egyptian amulets—one in the form of an ape, the second a lion-headed figure, the third perhaps a Bes. One Crusading coin of silver was found near the surface.

We may now describe the city wall, small portions of which we found exposed on our arrival at *a*, *b*, *c*, *e*, and *f*. Long sections were laid bare by excavation. At the points tested it was found to rest on from 6 to 11 feet of *débris*. It was seen at two points to be 12 feet thick, and consists of external and internal facings of rubble, with a filling of earth and field stones. The face stones are laid in mud mixed with straw. Projecting from the wall, at intervals ranging from 28 feet to 35 feet 9 inches, are buttresses, ranging in length of face from 30 to 34 feet. The maximum projection is only 2 feet: this is necessarily exaggerated on the small scale plan. The masonry consists of rudely-spaced rubble set in courses ranging in

height from 1 foot 3 inches to 2 feet. The stones are roughly squared, except at the coigns of the buttresses, where the work is much better. The interstices are filled in with mud and small field stones. The masonry is mainly plain-faced, though two or three drafted stones occur. Signs of dressing are very faint, and I prefer to postpone my description till I have had time to examine carefully each stone in the deep shafts. In places the wall has been plastered with dark mud and straw, over which is a layer of white mud mixed with straw made by mixing a powder of unburned limestone with water. This kind of plaster is used in the Lebanon to-day. At *b* five courses crop out above the surface, and this is probably the part seen by Dr. Petrie, and rightly taken by him to be a portion of the ancient rampart.

Immediately to the south of the Wely there are traces of mud-brick, reduced by conflagration to burned brick, cropping out from the surface. This occurs in the line of the city wall, and we have begun operations in order to see whether the wall at this point is entirely mud-brick or whether it has stone foundations. We have proved the existence of a thick brick wall, but neither its thickness nor the character of its foundations have been yet determined. At the south end of the projection at *c* we sank a shaft to the rock, finding 33 feet of the wall standing on 7 or 8 feet of *débris*. At 19 feet occur the flooring and walls of a room which appears to have been built in late times against the outer face of the rampart. The absence of a buttress along the 60 feet traced at *d* is curious. Here at the base of the wall is a one-course footing with an offset of 1 foot 9 inches. At *e* a short flight of steps descends along the face of the buttress. Part of the wall at *f* has a marked batter, 2 feet 6 inches in 15 feet. It stands to a height of 21 feet on 11 feet of *débris*: the upper courses were exposed on our arrival. The regularity of the buttress system at *g* is noticeable, the paces measuring 34 feet, 33 feet 8 inches, 34 feet, 33 feet 8 inches, and 33 feet 10 inches, and the inter-buttress spaces 33 feet 7 inches, 32 feet, 31 feet 6 inches, and 33 feet. To attempt to trace the wall eastwards from *g* and around the slope would be unedifying, as its course is clear. Were there

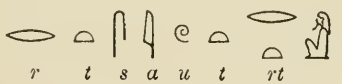
ever any wall along the north cliff, which is improbable, its course is equally plain. However, we hope to trace the wall



Fragments of Statuettes from Ancient Rubbish Heap at Tell-es-Sâfi.

westwards from *c*, in order to find its connection with the mud-brick wall, and in the hopes of finding a gate which was probably on the south side.

To the tracing of this wall at *f* we are indebted for the most interesting objects discovered at Tell-es-Sâfi. Part of this section is under the modern rubbish heap which was proved to have been superposed in part over an ancient rubbish heap. In front of the wall and along its ruined top was found a strange mixture of objects of which I can give now only a general summary: pottery ranging from early pre-Israelite to late Greek, including a stamped jar-handle with two lines of Hebrew writing; busts and other fragments of statuettes in limestone; fragments of face-masks in pottery; figurines in pottery in great variety, including one which appears to be Pan; Egyptian amulets; beads in great quantities; a Babylonian scaraboid; fragment of a Ushabti figure, with hieroglyph inscription, &c., &c. A mine suggesting such possibilities of discovery deserved working, and two gangs of competent men have been tracing its limits, passing every basketful of earth through sieves. We appear now to have reached the limits of this precious stratum. North and south it extends over a length of about 35 feet only; at the east it comes to an end at a rude wall several feet out from the rampart; on the west side it does not seem to extend beyond the inner face of the rampart, though we have not given up all hope in that direction. These objects were plainly cast down at one time, at a period when the rampart was in ruins. The statuettes are certainly not classic Greek. They suggest the late Palmyrene statues, as well as the archaic Greek figures found in the making up below the Acropolis at Athens. The excessive ornamentation of robes and head-dresses is common to both. A general photograph is now submitted, but photographs of each fragment will be taken later. From the slight study I have been able thus far to give to the objects from this rubbish heap, I am inclined to think that the interruption in the history of the tell occurred at a period later than that suggested by the pottery exhumed in the clearance pit. In tracing the wall at *g* a very small fragment of an Egyptian stele was found, reading as follows:—



r t s a u t rt

N

The stamp on the jar-handle just referred to is in the form of a rude circle, 1·25 centimetres in diameter, with two lines of Hebrew writing, separated, as in the case of well-known Hebrew seals, by two parallel bars. In stamping an unequal pressure was used, hence the right upper corner is not plain. Four letters appear clearly in the upper line with traces of another, probably a *lamed*, at the right. The top of the next letter is incomplete, but it is probably a *resh*. The only possible alternatives would be a late form of *tsade*, as found in examples of Maccabean times, and a form of *samech* found in the Siloam inscription. The last three letters are unmistakably פתי. Taking the letter immediately before as a *resh*, we have the word רפתי, the construct form of the plural רפתים, found only once in the Old Testament (Hab. iii, 17), where it

Stamp on Jar-handle from Tell-es-Sâfi.

is translated as *stalls* (for cattle). The singular does not occur anywhere. Five letters appear in the second line, which reads יהואל, the only doubtful letter being the third, which is not precisely like any example of *vau* known to us, but which resembles a *vau* more than it does any other letter. . By analogy with other stamps this word must be a proper name, and the combination of יהו (Jahveh) with other words in a proper name is common. The meaning of the name is thus: "Jehovah is God." As an example of a proper name of similar composition we may cite Jehiel—"Jehovah liveth." It is interesting to have found evidence of Jahveh worship at this site. Taking the first letter of the upper line as a *lamed*, by analogy with other stamps, the whole inscription reads:

"Belonging to the stalls or stables of Jahuel." On the discovery of this jar-handle I wrote the Committee that the upper line probably read לרפאי, to be translated "To the shades of——." Unfortunately for the eschatological possibilities involved in this reading it cannot be maintained, as a more careful cleaning (by placing the jar-handle overnight in vinegar, and then using a brush) has shown that the fourth letter cannot be an *aleph*, but has the single crossbar characteristic of a *tau*.

The question may now be asked: what light have our investigations thrown on the identification of Tell-es-Sâfi with Gath? This identification was originally advanced purely on the grounds of the importance and position of the site, no determination having been made of its antiquity. However, in 1890, Dr. Petrie made a brief examination of the surface pottery, and found pre-Israelite types. Our work has amply confirmed his observations. We have proved the existence of a city, built in pre-Israelite times, and probably fortified during the Jewish period. Gath was in existence at the time of Joshua's conquest (Joshua xi, 22), and was fortified by Rehoboam (2 Chron. xi, 8). Our proof thus is negative: nothing has been found to show that Tell-es-Sâfi cannot be Gath. Positive proof cannot be expected short of the discovery of inscriptions. That the tell contains such records is quite within the range of possibilities. That these may be found by us is a desire felt, I am sure, by all the readers of these lines.

TELL-ES-SÂFI, *June* 12*th*, 1899.

A BYZANTINE CHURCH AT UMM ER RÛS.

By R. A. Stewart Macalister, M.A.

The accompanying plate represents the ground plan of a small church that has recently been discovered at Umm er Rûs, about $1\frac{1}{4}$ miles from Beit Nettif and $3\frac{3}{4}$ miles from Deir Abân (Inch Survey, Sheet 17), in the course of agricultural operations. From the nature of the ground in the neighbourhood it is obvious that it formed part of an extensive series of monastic buildings, the foundations of which would no doubt be discoverable by excavation.

The church was an early Byzantine building of simple character, consisting of narthex, nave with side aisles, and chancel. There were two pillars on each side of the nave; the bases of three remain.[1] These no doubt supported a dome. The walls, to a large extent, consist of mud, with stone and plaster facing: the door jambs alone show good building with well dressed stones. (This is characteristic of early Byzantine work in Palestine.) It is noticeable that the doorways from the church to the narthex, and from the narthex out, are not opposite one another. There is a plain window, blocked up, in the west wall of the narthex beside the door, but no other opening is to be found in the existing portions of the walls. The maximum height of wall remaining is 5 feet.

At the east end of the south aisle is a shaft communicating with tombs under the church. It would be necessary to clear this out in order to explore them properly.

The chancel was screened with an eikonostasis, the sockets of which remain. It is raised two steps above the level of the nave. As tesserae of the mosaic pavement can be seen running under the steps, it is possible that this was an alteration subsequent to the completion and paving of the church.

[1] The south-eastern base has completely disappeared, but is shown in its proper place in the plan. The moulding of these bases is shown with the plan (above the apse of the church).

In the south-west corner of the south aisle is the usual drain for carrying off water used for washing the mosaic floor.

The patterns of the mosaic pavement are shown in the plan, but it is impossible to indicate differences of colour within the limits of the scale. The following list of the colours employed is therefore appended:—

Ground Colour.—Yellowish white throughout.

In the Chancel.—Large square in apse, blue line; cross of bluish grey stone (not mosaic); rectangles in corners of cross, red surrounded by blue line. [Mosaic fractured at ends of cross.] Small crosses at angles of square, dark blue with W-shaped finials in red; colours of small ornaments between them similar; dots on south side, blue. Knot between large square and ornamental cross west of it; a band of black, red (double width), yellow, black interlacing with a similar band having brown instead of red. [The latter runs north and south. The colours are enumerated from the outside edge inward here and in all similar cases.] Cross and inscriptions: cross, indigo line; circles upon keys and lozenge, brown; rectangles on keys red, with indigo margin. Hebrew inscription indigo, the others red. Scroll red; leaves and fruit blue; vase blue lined; the upper compartments red, of the five lower the first, third, and fifth yellow, brown, and yellow; the second and fourth red.

In the Nave.—Small squares at the ends of the keys of the cross; background of crosses blue, twists upon them red and yellow; yellow spot in the centre of each loop and between each pair and the edge of the cross. In the angles of the cross, lozenges blue, red, and yellow. Large cross; blue outline; guilloche blue, red (double width), yellow, blue. Angle pieces and V-shaped edge ornaments blue and yellow and red and yellow checker alternately. Central square blue and yellow checker in north-east and south-west quarters, red and yellow in the others. Ends of the horizontal keys, blue and yellow. A red line (broken in places by fractures, subsequently repaired with coarser mosaic) runs between the top of this cross and the eikonostasis. Square in north-west corner of cross; margin blue, corner spots red, outer guilloche, east and west members blue, yellow, red (double), blue; north and south members blue, yellow, indigo, blue. Circular segments between guilloches red on yellow ground; inner guilloche as outer (north-west member of inner same colours as west member of outer, and so on). Triangular dots in angles of inner guilloche blue, with red bases. Square, south-west corner of cross. Margin blue, corner-pieces red, with blue base and perpendicular; the members of the guilloche four square with the church blue, red (double), yellow, blue; the others blue, indigo (double), yellow, blue. Centre a checker of red and yellow with a blue lozenge and central dot marked on it. Red line between these squares and the large rectangle between them. Large rectangle below cross; all diagonal lines blue, all vertical and horizontal lines red. Blue line round whole. The dots are small lozenges of four tesseræ each, blue and red in alternate squares (blue in the north-east square). Guilloche at entrance, blue, red (double), yellow, blue. Red checker in the centre. Rectangle containing crosses: blue margin, crosses red and blue alternately (the two at the ends of each, red). Lozenges between, blue, red, blue.

In the North Aisle.—Row of dots in the corner, two blue tesseræ, one red in each. End crosses indigo, blue, red, yellow. Between aisle columns, margin of rectangle red and blue; squares blue, red, yellow, blue; lozenges blue, red, yellow.

In the South Aisle.—Between aisle columns, twist and included knots blue, yellow, red (double), yellow. Cross in circle at end, red; dots in corners blue, red; three crosses at top central blue (on foot blue, yellow, red), others red.

In the Narthex.—Margin of square blue; guilloche, first and third members blue, red (double), yellow, blue; second and fourth green instead of red. Crosses in circles green and red alternately. Central cross red.

Dimensions of the church:—Length of nave, 32 feet 6 inches; total breadth of nave and aisles, 28 feet 10 inches; aisles, 5 feet

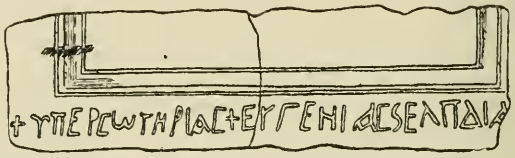


FIG. 1.—INSCRIBED FRAGMENT OF TOMBSTONE AT UMM ER RÛS.

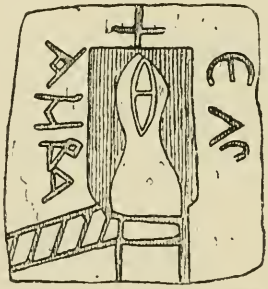


FIG. 2.—INSCRIBED STONE AT UMM ER RÛS.

10 inches across; depth of chancel, 16 feet; narthex, 7 feet 7½ inches by 30 feet.

The inscriptions in the mosaic at the east end are four in number—two in Syriac, one in Hebrew, and one in Greek. The three former are very obscure, and were probably set by some person unable to read them. I will not venture to say more than that the lettering in the longer of the Syriac inscriptions is not altogether inconsistent with a translation of the Greek legend, which also shows signs of illiteracy. It reads: + ΚΥΡΟΥ (*sic*) ΙΩΑΝΝΟΥ.

The lower fragment of a tombstone (Fig. 1) was found

lying on the fractured part of the mosaic south of the cross in the chancel. It is broken in two pieces. It bears the lower part of a moulded panel and the inscription—Ὑπὲρ σωτηρίας Εὐγένιας ἔλπδι (*sic*) Α[μὴν].

Perhaps the most interesting object in the church is a small cubical block of stone standing in the south-east corner of the north aisle. It bears engraved a design on its upper surface (Fig. 2) which seems to represent a human bust in a panel;

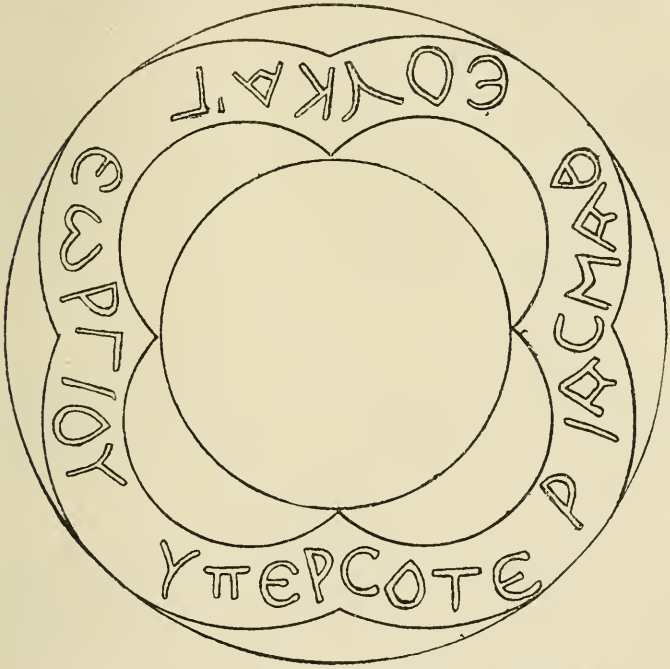


Fig. 3.—Greek Inscription on Font at Malkathah.

instead of a face is the letter *θ*. There is an inscription on the sides of the panel; the portion to the left seems to read AMBA, but that to the right is defaced. The ladder-like object on the left shows traces of red colouring. A squeeze is forwarded with this paper.

The discovery of an inscribed font at Malkathah, about a mile southwards from Umm er Rûs, may here conveniently be recorded. At this place there are extensive, but much dilapi-

dated, ecclesiastical remains, and also a large cave adapted as a columbarium. The font is cylindrical below, quatrefoiled above, and on the lip (Fig. 3) bears in five ornamental capitals the inscription— Υπὲρ σοτε—ρίας Μαθ—έου καί Τ—εωργίου.[1]

NOTE ON THE INSCRIBED JAR-HANDLE AND WEIGHT FOUND AT TELL ZAKARÎYA.[2]

By Prof. C. Clermont-Ganneau, LL.D.

The excavations recently undertaken by the Palestine Exploration Fund at Tell Zakarîya do not yet seem to have settled the question of the site of Gath.[3] At least, however, they have established the fact that an important Biblical city was erected there, the identity of which has still to be determined, and they have brought to light some objects of interest, two of which are of exceptional value, by reason of the Hebrew inscriptions in Phœnician characters which are engraved upon them. I beg to offer a few words of explanation upon these two objects.

1. The Handle of the Royal Jar of Hebron.

The enigmatic symbol accompanying the inscription is nothing but the *Egyptian scarab with four wings expanded*, seen from behind, with head on high. To be convinced of this it is sufficient to compare it with that which is engraved on the seal of Abd Hadad, which I have published

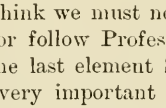
[1] *See* "Revue Biblique Internationale," 1896, p. 273.

[2] See *Quarterly Statement*, April, 1899, pp. 104 and 107.

[3] This topographical problem, as is well known, has given rise to numerous hypothetical and very divergent solutions. There is one that I do not remember to have met with before and which may, perhaps, be worthy of consideration. May not Gath possibly be, quite simply, Beit Jibrîn? Certainly a serious preliminary objection presents itself at once: Gath is clearly distinguished from Eleutheropolis—Beit Jibrîn—by the Onomasticon. But is this a sufficient reason for rejecting the hypothesis? The contradictions and halting attempts of the authors of the Onomasticon on this point show that they did not exactly know where to locate Gath. Beit Jibrîn was certainly the site of an important town; now, the equivalent of the site and name of Betogabra does not occur again in the Bible, and, on the other hand, the name of Gath disappeared early. May not the second name have replaced the first, just as, during the Greek period, it was itself replaced by Eleutheropolis? May not Gath, the home of Goliath ("the giant") subsequently have been called "the city of giants" (Betogabra). The proximity of Moreshat and Beit Jibrîn and the expressive determinative added to the name of the former city—Moreshat Gath—are to be observed.

in my "Recueil d'Archéologie Orientale," vol. i, p. 167. This establishes a primary and close connection between this handle and those formerly discovered by Sir Charles Warren at Jerusalem, at the south-east angle of the Haram, which exhibit, by the side of the inscriptions, a symbol also of Egyptian origin and of an equally popular character, the winged disc with a bird's tail.[1]

As to the explanation of the inscription למלך חברן L-M-L-K H-B-R-N, there is little doubt that we must, in this case, regard Hebron not as a man's name, but as the very name of the well-known city. This seems partly to lend force to the opinion formerly expressed by Professor Sayce (*Quarterly Statement*, 1893, p. 240) as to the interpretation of the similar stamps upon the other jar-handles just alluded to: viz., that Z-PH, in the inscription L-M-L-K Z-PH, must be the name of the city of *Ziph*, and that [SH ?]-K-H, in the inscription L-M-L-K [SH ?]-K-H (if this restoration of the last letter but one be correct) might be the name of the city of *Soko*, belonging to the same district. We should, in this case, be obliged to abandon definitely the idea of proper names of persons, compounded with the element *Molech*. As for the third inscription in the same group, I think we must not read (as has hitherto been done) L-M-L-K SH-T, nor follow Professor Sayce in looking for the name of the God *Seth* in the last element SH-T; the truth is, account has not been taken of a very important material fact, viz., that the inscription is not complete. The two last characters were certainly *preceded by one or two letters* which have disappeared, and of which the place may still be seen. This is clearly shown by the arrangement itself of the inscription, symmetrically divided into the four angles formed by the symbol :—



Under these circumstances, SH-T accordingly cannot be regarded as forming a complete word: it can only be the termination of a longer word, perhaps (to judge by analogy) another name of a city: *Moreshat?* שת[מר]??

As for the word M-L-K, preceded by the possessive *Lamed*, with which all these congeneric inscriptions commence, we can hardly follow Professor Sayce in seeing in it the name of the God *Molech* or *Moloch* ("to the *Molech* of this or that city"). On the other hand, if we assign to M-L-K the usual sense of "King" (*melek*), it is just as difficult to admit that there could be any question of *a King of Hebron*, *a King of Ziph*, &c. According to palæographical considerations, all these seals cannot be older than the Kings of Judah. Now, it is historically impossible to admit at such a period the existence of petty kingdoms analogous to

[1] For reasons which would be too long to state here, I am inclined to believe that this symbol is really that which the Israelites called the *Kabod*.

those into which Palestine was parcelled out at the time of Joshua's conquest. At most it could only be a question of "governors," but the title *melek*, applied to mere governors, would be too high-sounding.

Perhaps the solution of the question may be that which was suggested to one of my pupils, M. Daveluy, by the discussion to which I submitted these inscriptions in my lectures at the Collège de France. This would consist in isolating the two parts of these short inscriptions, suppressing any grammatical relation between them, and interpreting לַמֶּלֶךְ "to the King," taken absolutely, and not לְמֶלֶךְ, "to the King of"; that is to say, "belonging to the King" [of Judah]. The name of the city would follow, quite independent of the word "King," and varying according to the country of the vases and indicating their origin :—

To the King.—Hebron,
To the King.—Ziph,
To the King.—Socho,
&c., &c.

Following this order of ideas, we may imagine that these vases were intended to contain products—of oil, for example, of wine, or, perhaps, flour or grain—representing the tributes furnished in kind to the royal storehouses by the chief cities of the kingdom. This would adequately explain the presence at Jerusalem of those vases stamped with the names of different cities, all characterised by the general official expression : (belonging) *to the King*. From this point of view, it is well to take account of the significant material fact that the handles of Jerusalem were found at the very approaches to the royal palace. M. Daveluy has ingeniously reminded us in regard to this (*see* 1 Kings iv, 7–19, 22, 23, 27, 28) of the 12 commissaries (*nissābīm*) of Solomon, whose duty was to collect month by month in turns throughout the kingdom, the dues in kind of every class, and, in particular, the provisions necessary for the royal table. We may add 1 Chron. xvii, 25–31, referring to the reign of David, and, above all, 2 Chron. xxxii, 28, where mention is made of the royal storehouses of Hezekiah for wheat, wine, oil, &c.[1]

If this was the case, we can understand that it was to the interest of the royal authority that the jars intended for this purpose should be under control to prevent all fraud in regard to the amounts to be delivered. Evidently the most practical method was to require that delivery should be made in receptacles gauged beforehand and officially stamped with the royal seal ; hence the first inscription, L-M-L-K, equivalent, in short, to our formula, *His Majesty's service*. The cities being each taxed at so many jars, a second inscription indicated respec-

[1] *Cp.* Ezekiel xlv, 14–16 : the tithe of oil due to the *nasi* in Israel by "the people of the country."

tively the name of the city to which these jars were apportioned. The stamps being impressed upon the clay before the baking, we may presume that the vessels were made in advance at the royal manufactories, the existence of which appears to be indicated by the rather obscure passage in 1 Chron. iv, 23.

As for the presence at Tell Zakarîya of a handle stamped with the name of Hebron, it may be readily explained in various ways. For instance, jars from Hebron destined for the capital (or *vice versa*) might have been temporarily transported to the city represented by Tell Zakarîya to be sent on to Jerusalem, together with other jars coming from different towns in the district, and deposited here as a central point. Or again, an order might have been given to Hebron to deliver at the neighbouring city a certain portion of the dues in kind, at a time when the towns of the district were being put on a war footing and supplied with victuals and munitions, by way of precaution against an invasion from the South. On this point 2 Chron. xi, 6–10, is very instructive, since it shows us Rehoboam fortifying a whole group of the cities of Judah, naming the military commanders, collecting stores of shields and javelins, and, above all, forming depôts for provisions (*otsrot maakāl*), in particular, *oil* and *wine*. It is a striking fact that amongst these cities we find three of those the names of which we read upon our jar-handles: Hebron, Ziph, Socho. Who knows whether, amongst the others enumerated in this passage, the name of the city which was built upon Tell Zakarîya may not be concealed? I do not mean to say that this would render it necessary to date the handle which has been found as far back as the age of Rehoboam; the form of the letters seems to indicate a considerably later period. But the same alarms and preparations must have been repeated several times during the history of the kingdom of Judah, that is to say, whenever an invasion from the South was feared, and consequently almost as long as the kingdom of Judah lasted.

If this interpretation has any foundation, it leads us to hope that we may find in the future, in the form of handles and jars stamped by the royal authority in the name of the principal cities of Judah, a series of brief documents, which would be of the highest importance for the historical geography of the Bible. It is a new branch of Semitic epigraphy from which more than one precious result may be looked for.

2. The Weight of Tell Zakarîya.

After a further and minute examination of the inscription engraved upon the weight, I think we must abandon the idea of reading K-S-PH. From a strictly palæographical point of view the reading seems to be neither K-S-PH nor N-Z-PH, but N-TṢ-PH. The same reading appears to me to be the result of a comparison with the "bead" formerly found by Mr. Clark in a tomb at 'Anāta; the inscription engraved upon it presents the most striking points of similitude to the latter, and even the

form of the object is almost the same. I had formerly thought that it might have been read K-S-PH (*Quarterly Statement*, 1893, p. 257), and it is perhaps this that decided Père Lagrange to adopt this same reading for the weight of Tell Zakarîya. But in this case, also, I incline now to read N-TS-PH, and not N-TṢ-G as proposed by Professor Sayce (*Quarterly Statement*, 1893, p. 32).

Lastly, it is the same word which is found again, according to all appearance, upon Dr. Chaplin's weight, but in more archaic characters and more decided forms. I do not exactly know how to explain it; it reminds one remarkably of the Arabic *Nisf* ("half"),[1] a comparison which led M. Euting (certainly wrongly) to suspect the authenticity of Dr. Chaplin's weight, which has been so much discussed. Whatever may be the origin and real meaning of the word employed, which recalls the Hebrew *Khatsi* ("half") on Jewish coins, for *Khatsi sheqel* ("half shekel"), and the Biblical *beqa'* (same meaning), it certainly seems to designate a specific noun of weight. It is this that tends to show the agreement of these three little congeneric objects.

For these three weights, so closely related from the epigraphical point of view, are equally so from the metrological. In fact, the weight of Tell Zakarîya weighs *about* 154 grains; now, Mr. Clark's "bead" weighs, *in its present state*, 134 grains; but, as I have already remarked (*Quarterly Statement*, *l.c.*), it has been at a later period converted into an amulet, and *pierced* so as to be worn in a necklace, and the loss of matter sustained in consequence of this operation must be taken into account. The estimate of this loss, which I desired to know, has been made, and has been fixed, in a note by the Editor, at 22 grains, which would bring the original integral weight to 156 grains. These two weights, that of Tell Zakarîya and that of Mr. Clark, are thus practically equal, the difference being only two grains, and even this difference may be due to a slight error in the estimate of the loss sustained by the second. Now, each is qualified by N-TṢ-PH. On the other hand, Dr. Chaplin's weight weighs 39·2 grains, and, according to the inscription carved upon it,[2] it is *a quarter of* N-TṢ-PH. The other part of the inscription is in a bad state of preservation and obscure, but I do not think we ought to read it, as has been proposed, רבע של רבע נצ, "quarter of a quarter (viz., one-sixteenth) of N." This would be a very unusual and clumsy mode of expression, not to mention the improbability of the existence of the particle של at so remote a period. Possibly this other portion is grammatically independent of the first and simply רבע ש(ק)ל, "quarter of a shekel," which would imply the metrological identity of shekel and N-TS-PH.

[1] The etymology of the Arabic root, N-Ṣ-F, is obscure, but it may well be a very ancient root, although isolated in the Semitic family: *cp. naṣif*, the specific name of a certain measure of capacity.

[2] רבע נצף "quarter of N-TS-PH."

Now, 39·2 grains × 4 = 156·8 grains, a figure very little removed from those of the two entire N-TS-PH, that of Tell Zakarîya and that of Mr. Clark, especially if we admit that they have not reached us in an absolutely perfect state.

With reference to the inscriptions on the jar-handles, Professor H. V. Hilprecht, writing in the "Sunday School Times" of Philadelphia, May 27th, 1899, remarks:—"I do not think that Dr. Bliss has determined the age of this object and the meaning of its inscription correctly. It is entirely impossible to assign this jar-handle to the period commencing with the Hebrew conquest and ending with the establishment of the kingdom of Saul. Paleographical reasons forbid it. A careful comparison of this jar-handle with those excavated by Sir Charles Warren in 1869 (compare Pilcher's articles in the 'Proceedings of the Society of Biblical Archæology,' and my own note in the 'Sunday School Times,' January 28th, 1899), and the characteristic forms of the Hebrew letters 'm' and 'k,' force us to the conclusion that this object belongs to the period 300 to 1 B.C., and therefore is considerably later than is assumed by Dr. Bliss. The inscription is not to be translated 'Belonging to the King of Hebron,' or 'Belonging to King Hebron,' but 'To the King—Hebron'; that is, 'Hebron has devoted it to the king,' or 'made it for the king.' The verb is to be supplemented as very commonly in Semitic votive inscriptions, letters, despatches, and similar texts. Hebron is known from 1 Chron. ii, 42, *et seq.*, and vi, 2, as a personal proper name. Hebron in our inscription is probably the name of the potter who made the jar."

NOTE ON THE OBJECTS DISCOVERED BY DR. BLISS AT TELL ZAKARÎYA.

By Professor A. H. Sayce, LL.D.

Several of the objects discovered by Dr. Bliss carry us back to the pre-Israelitish period of Canaanitish history, and raise the hope that cuneiform tablets may be found by him before long. Those of which casts have recently been sent home by him are as follows :—

1. A jar-handle, with a stamp representing an Egyptian deity, which at first sight looks like Thoth. A comparison of it, however, with the Sidonian seals of the Tell-el-Amarna age in the collection of M. de Clercq makes me believe that it is intended for Set, though, owing to a fracture, the ears of Set are no longer visible. From the Sidonian seals we may gather that in the time of the eighteenth Egyptian dynasty Set was regarded as the patron deity of Canaan.

2. A jar-handle similar to those found at Jerusalem by Sir Charles Warren. In the *Quarterly Statement* for July, 1893, pp. 240–242, I proposed to see in the names which were written under the winged solar disc of the stamp the geographical names, Socho and Ziph. My view has been verified by Mr. Bliss's discoveries, the name of Hebron (חברן) appearing on one of the jar-handles he has found (*Quarterly Statement*, April, 1899, p. 104), while the one before us has Socho or Shochoh, written *plene* (שוכה). It is now plain, however, that I was mistaken in seeing in the words למלך, which are always written above the winged disc, the name of a god, Moloch ; they must mean simply "belonging to the king," and indicate that the potteries from which the jar-handles have come were a royal monopoly. An explanation is thus afforded of the passage in 1 Chron. iv, 22, 23, where the corrupt state of the text has hitherto made both translation and interpretation doubtful. It tells us that the potters of Chozeba, of Moab (?), and of [Beth-]lehem worked for "the king," and the corruption of the text is doubtless due to the fact that "the account," as the Chronicler states, was derived from an "ancient" document.

It is curious that we invariably find למלך instead of להמלך with the definite article. The omission of the article was a characteristic of Phœnician. Does it imply that Hebrew was the language only of the court and the capital, and that the country population of Judah continued to speak the old Canaanitish language which we term Phœnician? However this may be, the inscription reads "[Belonging to the king]; Socho," the pottery being crown property and being situated at Socho.

3. A jar-handle with a picture of a horse in the Egyptian style of the eighteenth or nineteenth dynasty.

4. A jar-handle with the letters לְמֶלֶךְ "Belonging to the king" above the winged solar disc. Below is a *zain* followed by two letters, the first of which is the upper half of a *yod*, while the third shows the upper line of a *pê*. As one of the jar-handles from Jerusalem gives us the name of Ziph, it is clear that we must read זִיף, Ziph, here.

5. Eight Egyptian scarabs, none of which seems to be later than the age of the eighteenth dynasty. On (*a*) we have the goddess Sekhet and the god Sebek in the form of the lion and crocodile, with the disc of the Sun-god Ra above. On (*b*) is Sekhet in the form of a lion with a horizontal *ânkh* or symbol of life. (*c*) Is one of the so-called *nub* scarabs which are generally assigned to the Hyksos period, and usually indicate, I believe, Syrian influence. Above the hieroglyph *nub*, "gold," is *suten net* (?), "king of Upper and Lower Egypt"; on the left-hand side is *ânkh*, "life," and on the right *nefer*, "good," enclosed in a cartouche. On (*d*) is a blundered Ra-men-kheper or Thothmes III, followed by the name of Amon and the eye of Horus. Similar scarabs have been found elsewhere in Palestine, and are probably the work of Canaanitish artists, who copied the Egyptian hieroglyphs for ornamental purposes without understanding what they meant. On (*e*) we have Amon-Ra, but the workmanship again does not seem to be pure Egyptian. On (*f*) we have a similar blundered product of Canaanitish art. Ra-kheper is written instead of Ra-men-kheper between the two royal uræi, and underneath is a non-Egyptian ornament formed of three *t*'s and six *hez*'s (?). On (*g*) is the name of the god Ptah of Memphis, with the reed (*a*) by way of filling up the space on the right; (*h*) presents us with a modified form of an ornament which is characteristic of the time of the twelfth-eighteenth dynasties. All the eight scarabs appear to be of Syrian workmanship, and to belong to the age of the eighteenth Egyptian dynasty.

7. Rude Canaanitish seal on which I can throw no light.

8 and 9. Weights each inscribed with the Phœnician letters, בצף. The same weight with the same name was obtained by Dr. Chaplin from the site of Samaria, and has been described by myself in the *Quarterly Statement* (where, following Dr. Neubauer, I have erroneously read the last character as a *gimel*). The weights found by Dr. Bliss, however, prove that it is really a *pê*, and M. Clermont-Ganneau is doubtless right in connecting the name, בצף, which we thus obtain, with the Arabic *nusf*, "half."

10. A mould of blue glass with the representation of a chariot and horse which is galloping over the body of a fallen foe, while another foe is depicted behind the chariot in the attitude given by Egyptian artists to a prisoner. Inside the chariot are the driver and a warrior who are divided from one another by a forked stick,[1] while above the horse is the

[1] This forked stick resembles the two-pronged spear carried by the "Lykaonian" soldier, with Hittite boots, discovered at Ikonium by Texier ("Description de l'Asie Mineure," II, Pl. 103), but since destroyed.

crescent moon with the old moon between its horns. As in the Hittite chariots, the wheel of the chariot has eight spokes. The whole representation is taken from a common Egyptian *tableau* of the eighteenth and nineteenth dynasties.

12. Another jar-handle with the words למלך שוכה: "Belonging to the king: Socho," written above and below the winged solar disc.

13. Babylonian seal cylinder, of white limestone, and of archaic type (B.C. 3000–2000). In the centre two winged sphinxes are arranged face to face in the heraldic fashion, which passed from Babylonia, through Asia Minor, into Greece. Above them are a lion and a deer, reminding us of the devices on the Hittite cylinders. The rest of the field of the cylinder is occupied by Merodach with his curved scimitar, the prototype of the Greek Perseus, with Tiamât in the form of a nondescript animal facing him, and a worshipper behind, while above is a composite animal, half hare, half stag.

14. A seal cylinder of black stone, with figures of men before two animals. It belongs to the class of early Syrian imitations of Babylonian cylinders, which are quite as rude as the archaic cylinders of Cyprus.

15. Blue porcelain ring, with the cartouche of Amen-hotep IV, Khu-n-Aten, to whom most of the Tell el-Amarna letters are addressed (B.C. 1400). The colour and *technique* of the ring show that it is contemporaneous with the king whose name is inscribed upon it.

The jar-handle discovered by Dr. Bliss at Tell-es-Sâfi is of great interest, though unfortunately the mixture of objects of various periods in the rubbish heap in which it was found does not allow us to fix its date. The stamp upon it is divided by the double line characteristic of Israelitish, Jewish, and Moabitish seals. The impression, however, is not sufficiently good to allow me to read the inscription with certainty, but it seems to be (1) לרפתי, (2) יהואל, "Belonging to the Rephathite Joel." The name of Raphah is found in 1 Chron. viii, 37, and the Rephaim are called "the children of hâ-Râphâh" (2 Sam. xxi, 16, 18). Mr. Bliss makes the last character but one in the first line an *aleph* instead of *taw*; if so, we should have the name of the Rephaim, who, we are told, were settled in Philistia. Ishbi-benob, Saph, and the six-fingered champion of Gath were all Rephaites or Rephathites (2 Sam. xxi, 16, 18, 20). If Mr. Bliss's reading is correct, the last letter but one in the second line could not be *aleph*, and would rather represent a *kaph*; this, however, would give us a name which I cannot explain. The name of Joel indicates a period when the Philistines had been thoroughly Judaised.

REPORTS BY DR. CONRAD SCHICK.

I.

1. *A Stone Pillar, partly quarried.*—North-west of the city of Jerusalem, one and a quarter miles distant from the Jaffa Gate, and about 600 feet south of the Jaffa road, there was recently discovered a pillar made of "native stone," such as Josephus ("Antiq.," viii, 3, 9) tells us was used for the cloisters of the Temple. Here people had in ancient times begun to cut a pillar out of the living rock, 24 feet long and 3 feet 3 inches in diameter. The upper half is finished, but the lower part is still massive rock. It is just such a pillar as was found on the Russian property, but the latter is somewhat longer and of greater diameter (*see* Memoir, Survey of Western Palestine, the "Jerusalem" volume, p. 409, under the heading El Muskobîyeh), also it has a crack in the middle, and hence was never finished, whereas this newly found one is sound, bu still rough, and not worked so smooth as the Russian one. I have also seen in this region much smaller ones, but they are now quarried away.

2. *The Jericho Boil.*—Since the plain of Jericho has become more cultivated, some houses built, and people living there, it happens that Europeans who reside there are troubled with a kind of boil, which lasts for a time and then heals. It is not certain whether this happens only at a certain season or in every season, nor whether every one becomes affected with it or only those particularly disposed to it. People say that it is somewhat similar to the Aleppo boil. It seems also that it affects only those who stay a long time there. If once the cause of it can be found out, the remedy will also be found.[1]

3. *Remains of another Church in the Muristan.*—The Greek Convent have removed a great deal of earth and rubbish from the part of the Muristan which belongs to them, and is building shops along the new street which has been made west of the new German Church of the Redeemer, joining the northern street (on Ordnance Survey map $\frac{1}{2500}$, called Hârat ad Dabbâghîn) with the southern, Sûk al Bizâr. This street is called Prinz Friedrik Wilhelm strasse, in memory of the father of the present Emperor, who in 1869 took possession of the eastern part of the Muristan. Amongst several traces of walls and piers there were also discovered indications of a former church with three apses, and nearly the same size as the Erlöserkirche ; only the middle and southern apses were found, the northern one being entirely destroyed. The convent are

[1] These boils are commonest in the autumn, and they are connected with malarial fever. They generally appear on the hand, wrist, &c., in just those parts which mosquitos attack. The latest medical theory of malarial fever shows (by aid of elaborate experimental research) that the germ is developed in the bodies of mosquitos hatched in infected water, and is by them conveyed to the sufferer. Perhaps, therefore, the boils are only another symptom of the poison which is thus introduced into the human blood.—C. R. C.

about to remove the remains, as they do not want to restore the church or to build a new one there, having, as they say, enough churches already. The site is to be used for shops and houses. Should I be able to gather more details I will prepare and send a plan. This church stood on the cisterns which Sir Charles Warren found in 1867 (*see* "Recovery of Jerusalem," London, 1871, p. 272).

4. *Jewish Colonies.*—Baron Rothschild, of Paris, has visited the Holy Land to inspect the various Jewish colonies established under his protection and with his help. He came one day to Jerusalem to visit the Pasha and the French Consul, and also went into the Haram Esh-Sherif. He arrived a little before noon and departed for Jaffa again in the afternoon of the same day, and declined to receive the papers and petitions which the Jews desired to present to him. It is said that he did not find things altogether satisfactory, the large sums expended not having produced the hoped-for result. So one must be sceptical when hearing that more colonies will soon be established. In these colonies chiefly vines were planted, which produce a great quantity of wine, pure for Jews, and it was hoped this would bring a large income, but it seems the price is too high, so that it cannot be sold as largely as is desired. They now think of planting olive trees.

5. *A Curious Stone Basin.*—A curious basin was brought by a peasant to Jerusalem, of which I enclose a drawing one-fifth of its real size. It was said to have been found in a cave or tomb. It is of a hard stone, of grey colour, a kind of basin elevated on three legs. The cavity is rather shallow, and has in its centre another shallow depression. It was certainly not for keeping any fluid in; but as there is a groove in the larger of the four side-ears—which were most likely used as handles—it seems as if sometimes fluid might run out when the basin was turned to its side. The use of it is a puzzle: some think it to be a basin on an altar of offering; others nothing more than the stand for an earthen jar or pitcher, Eastern jars being generally round below, and having to be stood in earth or on a board with a hole in it. If this was the real use, why was it made of such hard stone? If made of much softer stone it would have served the same purpose. As the stone of which it is made is not found in Southern Palestine, it must have been brought from another place.

The basin was brought by a Fellah from Beit Nakûba (near Abu Ghôsh), and he said there was another stone with it—but not brought here—which, according to his description, was a kind of rubber. So perhaps this basin was used for rubbing something, as paint, spices, &c.

II.

Contribution to the Study of the Ancient City Walls of Jerusalem.

All authors who have written on the topography of Jerusalem have given more or less distinctly some account of the lines of the ancient walls of this remarkable city. The matter is not so easy, as these walls have undergone many changes and rebuildings, and the very little that actually remains of them is buried in the *débris*, so it is quite natural that scholars have suggested various lines of them. One thing seems to me to have been generally overlooked, and of this I will now speak. Always considering the walls as having been single, like the one of to-day, leads either to wrong results or becomes open to objections; for the walls were not single, but apparently had their outer or ante-walls, as history and the nature of the case show.

After the captivity, Nehemiah built the walls, as far as that could be done, on their old foundations, and following the former lines. Of this a somewhat complete report is given by Nehemiah himself in the third chapter of his book, and there are occasionally remarks on the subject in other chapters. In Neh. iii, 11, 19, 20, 21, 24, 27, and 30, is mentioned "the other piece," which is generally taken to mean that the said man or party made, besides his allotted share, a second piece somewhere. But taken in this way, we are not told at what part of the wall this was; nor is it mentioned who were the parties on the two ends of this "other piece." So I take it as meaning the outer or ante-wall, which certainly had not to be made so high and strong as the main wall. Much of the old wall may have been still standing, especially on the west and south side of the city, whereas on the east side, and in the neighbourhood of the King's House and the Temple, it had been destroyed, as appears clearly from the verses 19 to 30, describing *two* lines, the *inner* one, or main wall, and the *outer*, or "second" part or "another piece," as it is translated, and sometimes, as in verses 25, 26, and 27, this is explained by the words "over against."

A further proof that the main wall had an ante-wall some distance before it, or further out, results from Neh. viii, 1, 3, 16. The bulk of the people were (verses 1, 3) gathered in the street before the "Water Gate" in the open air, but certainly in a place enclosed by some outer wall. That it cannot mean the Water Gate of the Inner Temple, near the altar of the burnt offering, is proved by verses 8, 16, where it is said, "The people made themselves booths, every one upon the roof of his house, and in their courts and in the courts of the House of God, *and in the street* (or place = court) *of the Water Gate, and in the street of the gate of Ephraim.*" Here, after the courts of the Temple, is mentioned also the place of the Water Gate in which booths were made, hence it cannot mean an inner gate. It is also put parallel to the Ephraim gate, which certainly was not a Temple, but a city gate.

In 2 Sam. xviii, 24, we read: "David sat between the *two* gates," viz., one in the main wall and one at some distance in the outer wall. So it seems to have been also at Samaria (1 Kings xxii, 10), where the two kings are said to have sat in the open air, but within an enclosed place, in their royal robes before the gate at Samaria.

That oriental cities were fortified by two walls, an inner and an outer, together with a ditch, is also proved by the history of the Crusading time. William of Tyre, in his "History of the Crusade," 8, v, states that the Christian forces made such a bold and furious assault that the defenders left the outer wall, and drew back behind the main wall, when the assailants had broken down the first or outer wall. In Book 8, chapter xiii, is mentioned a "ditch" in front of the outer wall; the Crusaders worked to fill up this ditch and break down the outer wall, in order to push the wooden tower they had built near to the (main) wall. And in Book 8, xv and xvi, it is said: They were enabled to fill up the ditch, break down the outer wall, and push their wooden castle with much force towards the (inner) wall, to lay a bridge of timber over to the wall, and so get possession of the latter, all this in spite of the opposition made by the defenders of the city. This was done on the north side of the city; and in the meantime the Count of Toulouse did with his people the same labour on the south wall, opposite the Church of Zion, which was outside the town (*see* Book 8, xvii). They had brought their wooden tower over the ditch, having filled a part of it in three days, and further on so near to the wall that they, on its top, could fight with lances with those on the wall. Thus it was at Jerusalem; and that it was so also in other cities, we learn in Book 17, chap. xix, of Tripoli. After the Count of Tripoli had gone in company with the Princess of Antiochia for a distance, and after taking leave of her returned to the gate of the tower, he was pierced by some assassins, between the two walls (the outer and the inner), and so in a miserable manner killed. From all this we see that in the Crusading time at least, and most likely, also, from remote times, the fortifications of towns consisted chiefly of four things: (1) a ditch; (2) an outer wall; (3) a strip of free space behind (sometimes broader, sometimes narrower); and (4) the main wall. The Crusaders learned this kind of fortification, and transplanted it to Europe.

That Jerusalem, at the time of its greatest extent, after Agrippa's Wall had been built, in about A.D. 45, had outworks, or such an outer wall as spoken above, appears from the account which Josephus gives of the city, shortly before its destruction by the Romans. The main walls stood on the height, on the brow of the hills, on the west, south, and east sides; but on the north side there was no valley, and hence, in consequence of the gradual increase of the town, three different walls—the "first," the "second," and the "third"—were built. It is generally agreed that the latter stood not much further north than the present wall does; and as Josephus gives the circumference of the city as 33 stadia, we are obliged to suppose an outer wall, situated lower down,

in order to make up the line to 33 stadia. The length of one stadium is generally taken as 600 feet, or more strictly, according to Lepsius, "Längenmasse der Alter," Berlin, 1884, p. 26, equal to 180 metres. Hence 33 stadia, or the circumference of the city, held 5,940 metres.

According to Josephus ("Wars," V, 12, 2), Titus made a kind of wall round about the city, some distance from it, which was 39 stadia long. As Titus had already put his camp inside the outer or "third" wall, he used it as part of this circumvallation, and so beginning near the north-western corner, *i.e.*, at the camp of the Assyrians, and going eastwards to the east end, or the lower parts of Cenopolis, then crossed the Valley of Kedron and went up to the Mount of Olives, where, bending towards the south, and downwards, above the village Siloah, to Bîr Eyûb, carried his wall up the hill westwards, passing near "Hakeldama," to the top of the "Hill of Evil Counsel," *i.e.*, Pompey's Camp, and then northwards through the modern vineyards, passing Herod's Monuments (on the height west of the south-west corner of the city), and from here over to the north-west corner of the city, where it had begun: a line, $39 \times 180 = 7{,}020$ metres long. All the places mentioned are known and can be measured to prove these statements; and on doing this it will be found that the outworks of the fortifications, or the outer walls, had to include on the north the Jeremiah's grotto-hill, some part of the north-western height, where remains existed but have been now removed. On the other three sides of the city the outer wall falls nearly at the foot of the hills. At the junction of the Tyropœon Valley with the Kedron Valley it goes even down into the latter valley itself, as recent excavations have shown. East of the present *Haram* or old eastern Temple wall, Sir Charles Warren found an outer wall of great strength, and lower down the slope other inferior walls; and on the west, outside the Jaffa Gate, there were also ruins of walls and towers, now covered with earth or with houses built over them. So it seems quite certain that the outer line of the walls was once longer than is generally supposed, and therefore it is not necessary to bring out the "third wall" much farther north, as some topographers have done, in order to make up the 33 stadia; a thing for many reasons not allowable, nor would the 39 stadia of the wall of circumvallation permit of it.

THE ANCIENT STANDARDS OF MEASURE IN THE EAST.

By Lieut.-General Sir Charles Warren, K.C.B., F.R.S., R.E.

I.

Whilst investigating the length of the ancient cubit in Syria, I came upon a clue which has led me up to the system adopted by the ancients in Assyria, Egypt, and Syria, for the quadrature of the circle and calculation of areas and capacities required for weights and measures and for building purposes.

This subject in itself has nothing whatever to do with the Great Pyramid of Gizeh, but inasmuch as this Pyramid has been made use of by the ancients to symbolise a portion of the knowledge they possessed, it becomes the standard of reference for confirmation of much that I have to bring forward.

I have, however, to lay stress upon the fact that the knowledge possessed by the ancient wise men, when once the clue is obtained, can all be deduced entirely through the theory of numbers. In fact it amounts to this:—Given an intelligent people with good heads for geometrical calculations, what is the system they would adopt in squaring and cubing up their materials, and in calculating their weights and measures, and also their monetary matters, in the absence of the knowledge of the decimal notation for fractions, and in the presence of the necessity for keeping to whole numbers on all occasions as much as possible, even at the risk of extreme accuracy?

I think I can show that the system they adopted is just that which we should expect to be deduced with the limited power they possessed of calculation.

The Great Pyramid contains within it a coffer which records certain measurements of great importance, but these measurements might all have been recorded on papyrus and handed down, provided the one standard of measurement, the length of the cubit, is preserved intact. This is to be obtained from the *outside* of the Pyramid, and fortunately, thanks to the measurements of many investigators, but particularly to the rigidly accurate measurement of Professor Flinders Petrie, it is now obtained accurately in terms of measurement referred to our national standard.

This length of the cubit regulates everything connected with weights and measures, and even the weight of the gold, silver, and copper coinage. It was a grand idea to record on the Great Pyramid this length of the cubit in such a way that it was difficult to destroy it, as the tendency certainly is for the cubit, with all the weights and measures and coinage, to depreciate as years roll by, and it seems probable that the very slight discrepancy in the cubit in Egypt during many centuries is due to the existence of this record.

I commence this paper with the assumption that the length of a common cubit can be deduced within certain limits of error from the height of a man; the precise length, however, as used by the ancients can only be obtained from records such as the Pyramid, the Nilometer, &c., and I show that the standard length of the cubit is to be obtained to minute accuracy on the Pyramid.

In addition to the length of the cubit I give rules which governed the geometric system under which the Assyrians, Phœnicians, and Egyptians got out their dimensions, areas, and capacities. These would be the same whatever standard of measurement may be used.

So far as I can gather, this subject in its application has been untrodden ground for many centuries. Much that I am going to relate has been locked up in the Pyramid, and in the minds of the wise men of Assyria and Egypt, and was quite unknown to the Greeks of the time of Thales (B.C. about 640), and of the time of Pythagoras (B.C. 480) ("Greek Geometry, from Thales to Euclid," Allman, p. 47), but much of it is accessible to anyone who once gets the clue and realises the limits of the knowledge of the ancients.

The only intimation we seem to possess of the geometrical knowledge of the Egyptians in very early days is derived from the Papyrus Rhind (Allman, pp. 97, 98, 117). The properties of the circle were treated differently by the Greeks and Egyptians: the former devoted their attention to the determination of the ratio of the circumference to the diameter, while the latter sought to find from the diameter the side of a square whose area should be equal to that of the circle. In doing this, and in designing solids, such as cubes, cones, pyramids, and cylinders, the Egyptians found out certain rules and proportions, which they recorded in the Pyramid, and which I am bringing to light in this paper. The Pyramid, however, gives but one proportion

that need be used $\left(\frac{22}{7}\right)$, and it will be shown that no other proportion but this could be used, and that it can be deduced. What the Pyramid actually does is to confirm the deductions which can be made from the rules and formulæ of the ancients, and to give the length of the building cubit of 20·6 + inches, which, again, gives the length of the common cubit. Everything else follows from the laws deduced.

I wish to point out that I have been much embarrassed by the fact that the British inch, whether by coincidence or by unbroken handing down, is almost the exact equivalent of a unit which is deduced from the rules I have alluded to. I deduce it from two separate sources, viz. :—

$$\tfrac{1}{2}\sqrt[3]{4\left(\frac{22}{7}\right)^5 \times (10)^3} = 20\cdot61075\text{; and}$$

$$\tfrac{1}{2}\sqrt[3]{70{,}000} = 20\cdot60642$$

$$41\cdot21717$$

$$\text{Mean} = 20\cdot60858$$

$$\text{Building cubit as measured} = 20\cdot61090 \text{ British inches.}$$

$$0\cdot00232$$

(*See also* pp. 243 and 250.)

Now, the dimensions from which the mean 20·60858 is derived would be the same whatever may be the standard used—toises, metres, &c.—as they are derived from certain numbers. It is thus clear that the coincidence is one of great interest to all who study the connection of our measures with those of the past.

The following data, which I use, I take as being agreed upon by all :—

(*a*) That a building cubit was in use in Egypt in early days, of about 20·6 + British inches; that it was supposed to be divided into seven palms, the common cubit being divided into six palms, and therefore of about $\frac{6}{7} \times 20\cdot6 + = 17\cdot6 +$ cubits, or thereabouts.

And, further, that the building cubit of 20·6 + inches was in use in Babylonia, Assyria, Asia Minor (Temple of Ephesus, 20·58; Samos, 20·6) in very early times, and that it was used in prehistoric times in Western Europe and in England (Weights and Measures, "Encyc. Brit.").

(*b*) That the length of the base of the Great Pyramid of Gizeh, according to the latest measurements of F. Petrie, is 9,068·8 inches,

and the height 5,776· ± 7 inches, giving about 440 building or 512 to 514 common cubits for the base.

(*c*) I take it for granted that the learned amongst the ancient Egyptians, like all thinking men of the past, knew a great deal more of the primitive arts and sciences than they could express in language or symbols. For example, when Archimedes (say B.C. 250) pronounced the ratio of the circumference of a circle to the diameter to be less than $\frac{22}{7}$ and more than $\frac{223}{71}$ from the circumscribed and inscribed polygons, he knew a great deal more than he here affirmed; he knew that π lay nearer to the $\frac{223}{71}$ than to the $\frac{22}{7}$, and, judging from previous experiments, he could make a shrewd guess as to the approximate value of π, which he had no power of expressing.

(*d*) I propose to show in this paper that some of the knowledge of geometry supposed to have been arrived at by the early Greeks (Thales, Archimedes, &c.) was possessed by the builders of the Great Pyramid, who also possessed knowledge of which the Greeks and other contemporary nations were ignorant. Some of this knowledge I can find no reference to in any of the books I have consulted, and I do not think that it is recorded in any accessible document. Otherwise there would be reference to it in such books as De Morgan's "Budget of Paradoxes," or Ball's "Mathematical Recreations and Problems" or "History of Mathematics." It is interesting to find how near the verge of discovering these ancient mysteries were several recent investigators. Piazzi Smyth, for example, in Plate XX ("Our Inheritance in the Great Pyramid") shows the diameter of the circle derived from the area of the base of the Pyramid to be 10,303·3 inches, and the side of the square derived from the perimeter of the Pyramid base to be also 10,303·3 inches, and yet he does not seem to recognise that this is the key by which the mysteries could be unlocked; and from using inches instead of the building cubits he does not appear to realise the relation of the two circles one to another, but this probably has arisen from his attributing too much knowledge to the Egyptians, and supposing that they could express in their symbols the true value of π and could work in decimals, whereas they could get no further than $\frac{22}{7}$ for π, and had to confine their calculations to ratios and whole numbers.

(*d*) I assume that the builders of the Pyramid could readily extract the cube and square roots of a quantity, probably by "trial and error," if they first multiplied by some convenient number which would allow of whole numbers being used; and I think that they had tables of certain squares which approximated in area to those of certain circles.

They may also be assumed to have had in use the "abacus" or "swanpan" for adding and subtracting, and even multiplying and dividing.

(*e*) The measures which I shall particularly refer to are those of capacity, with some reference to measures of weight, including the weight of the gold and silver talents.

(*f*) I do not find anything in the dimensions of the Pyramid which refers to the shape, size, or density of the earth, or anything astronomical beyond the orientation of the sides and the direction of the great gallery to a point in the northern sky. So far as I have been able to observe, the Pyramid is simply a record of the measures, linear, capacity, and weight, which were in use in former days.

I will briefly summarise the points I bring forward.

(*a*) The existence in the earliest times of a common cubit after a man is deduced between the limits of 16·75 and 17·75 inches, probably approaching to the latter.

(*b*) In the very early days, perhaps in Egypt, but more probably before the migration from Assyria to Egypt had taken place, the wise men in designing buildings found it necessary to investigate the relations of the circumference of a circle to the diameter and to the area, and discovered that with diameter of 6 palms (the common cubit) they got a near value to this ratio (π) by using the number $2 \times 9\frac{1}{2}$ $(= 19)$; and in process of time they discovered that the cube of $9\frac{1}{2}$ closely approximated to $(6)^3 \times 4$.

(*c*) In carrying out practical investigations they learnt to within about 10 per cent. the ratio of the sides and radii of cones, pyramids, and cylinders of similar capacity to a standard cube, probably of 6 palms a side; and these became their standard measures. The cylinder of $9\frac{1}{2}$ palms radius and height being eventually found equal to a cube of 14 palms, this becoming their standard corn measure.

The cylinder on 6 palms, being the fourth part of this standard, became the quarter, to which the present *quarters* of Europe correspond.

Thus they had first the cube of 14 palms, then the quarter, the bushel, gallon, and pint, all in the forms of cylinders, pyramids, and cones, measured in whole numbers of palms. The standard measure being a cube of 2×7 ($= 14$) palms, the cubit of 7 palms naturally became the building cubit, that of 6 palms being used for ordinary purposes.

(*d*) They next attempted to square the circle, and found out some very curious properties relating to the perimeter and area circles belonging to a square figure; they then found a method of keeping to whole numbers in the circumference, radius, and area in a particular circle by means of using skew roots of their value of π, and eventually they hit upon using a multiple of the square root of their value of π as the circumference of a circle to find an area that would square accurately.

(*e*) They now found that there was only one set of circles that are suitable, involving the numbers 22, 25, 28, which they substituted for $7\frac{1}{2}$, $8\frac{1}{2}$, and $9\frac{1}{2}$ palms; so that they now introduced a new unit about one-third of a palm, which eventually came into use generally, and is called by us the "inch."

This change gave enormous facilities for accurate calculation, and the cube of 14 palms became also a cube of 41·2215 pyramid units a side, with a content of 70,044·16 P.U. They also found that using the same numbers as a ratio (22, 25, 28), they were enabled to get skew roots for their value of π in a very elegant manner, $\frac{22}{7} = \frac{44}{25} \times \frac{25}{14}$.

These numbers also represented the radii and sides of the perimeter and area circles derived from the square on 44. And they discovered that a cylinder of radius and height equal to $\sqrt{\frac{22}{7}} \times 10$ (equivalent to $\left(\frac{22}{7}\right)^{\frac{5}{2}} \times (10)^3 \times 4) = 70{,}044{\cdot}16$; almost identical with the 70,000 derived for the cylinder, and equal the cube on 41·2215.

(*f*) They then constructed a box-shaped chest set to the harmonical progression of $3, 4, \left(6 + \frac{6}{2}\right)$ for the interior dimensions, the bulk of which contained the same as the cube of 2 cubits of 7 palms, and the interior equal to a sphere with radius $= \sqrt[3]{\frac{70{,}000}{4}}$, called the Pyramid coffer.

(*g*) Having now arrived at the culminating point to which

their power of expressing their knowledge would allow them, they built the Pyramid on a scale such that the content was $(5)^3 \times 70{,}000$ times the pyramid of the capacity measure, and in it they placed the mysterious coffer which represents 4 quarters of corn, the bulk and content of which can be placed in a variety of measures, cubes, cylinders, cones, and pyramids, whose sides and radii are all an even number of palms or of pyramid units—6 palms, 7 palms, $7\frac{1}{2}$ (= 22 P.U.), $8\frac{1}{2}$ (= 25 P.U.), $9\frac{1}{2}$ (= 28 P.U.), 14 palms. The content of the coffer is to the bulk as 72,277·3 : 70,000.

It will be found on measurement that the pyramid and cone measures also are to the cylinders as 72,277·3 : 70,000. The object of this, possibly, is to allow of their being truncated to the amount of the difference, so that there may be a good base to stand on as a measure.

Thus the pyramidal measure of base, 44 units, may be truncated as far as the base 14, so as to allow of sufficient to stand on. A specimen of such a vessel is to be seen in the Etruscan room of the British Museum.

(*h*) It will be observed that there are five distinct classes of measure for the coffer of the Pyramid:—

(1) The original calculated dimensions of the ancients.
(2) The dimensions as given to the workmen.
(3) The dimensions to which the workmen carried out the job.
(4) The measurements of these dimensions as obtained by the surveyors—P. Smyth, Petrie, &c.
(5) The dimensions I have recovered from the rules of the ancients.

(*j*) It is difficult at first to suggest at what epoch the measures of capacity (all cubes) used by the Hebrews, Babylonians, and Phœnicians came into use. At first sight they seem to be later than the binary system used in Egypt; but it is clear that they were not measures taken arbitrarily, and owed their divisions to natural causes. The divisors are 2, 3, 10, and it will be found when we come to the subject that these divisions are caused by certain coincidences. For example, the cube of 14 is ten times the cube of $6\frac{1}{2}$, the former 30 baths and the latter 3 baths: 10 is thus a natural divisor. The side of the log ($1\frac{1}{12}$ palms cube) is one-sixth part of the side of 3 baths ($6\frac{1}{2}$ palms cube). The

content of this log plays an important part in the weight of a talent of gold.

* * * * * *

When considering the subject of the length of the cubit in former days in Egypt, my attention was arrested by the fact that various investigators had deduced no less than four distinct lengths for the cubit from the Great Pyramid, and the first attempt I made on the measurements of the Pyramid was to make sure whether this was practicable, *i.e.*, whether the investigators were really at variance, or whether they were expressing the same thing in a different manner.

The result was to me most embarrassing, for I found not only that three or four cubits could be readily deduced, all accurately, from the same measurements, but that at least seven or eight could be deduced with a very small percentage of error. This led me to look into the subject, when I found that, owing to the cubits being so many palms each, they had a distinct relation one to another, according to the number of palms taken to each.

For example, assuming that the building cubit was 20·6 inches (or thereabouts), we find that 440 of these measure the base of the Pyramid, but as this cubit is allowed to be of 7 palms, therefore the cubits of 5 and $5\frac{1}{2}$ palms will also go exactly a proportional number of times into the base without a remainder.

440 cubits	×	7	=	3,080 palms.
560 ,,	×	$5\frac{1}{2}$	=	3,080 ,,
616 ,,	×	5	=	3,080 ,,

Thus the same base gives us equally 440, 560, and 616 cubits of various sizes.

Moreover, if we admit of a slight error of about 3 per 1,000, which was very small at a time when the decimal notation was unknown, we have the following :—

684 cubits	×	$4\frac{1}{2}$	=	3,078 palms.
648 ,,	×	$4\frac{3}{4}$	=	3,078 ,,
536 ,,	×	$5\frac{3}{4}$	=	3,072 ,,
512 ,,	×	6	=	3,072 ,, , &c.

Thus we may arrive at ten or twelve different values for the cubit from the base of the Pyramid, ranging from $4\frac{1}{2}$ palms to 8 palms, and the subject evidently requires much consideration before any one cubit is relied upon as having been in use, and it

further does not necessarily follow that the building cubit of 20·6 + inches was the cubit that the Pyramid geometry was intended to hand down.

I thought it desirable, therefore, to begin at the beginning and deduce the length of the original cubit used in the East before building operations may have necessitated a change, and to find its relation to the 20·6-inch cubit, and the reason for discarding the common cubit in building for the 7 palm cubit.

At the present time the length of the cubit, according to various authorities, ranges from 16 inches (Conder's "Handbook to the Bible") to the 25-inch and 30-inch cubits of Reland.

II.—Deduction of the Approximate Length of the Common Cubit.

The early references to the size of the cubit are very meagre, and occur in the Bible in only a few instances.

(*a*) There is the cubit (Ameh) after the cubit of a man Deut. iii, 11.

(*b*) The cubit which is a cubit and a handbreadth. Ezek. xl, 5; xliii, 13.

(*c*) The great cubit. Ezek. xli, 8 (an obscure and uncertain reference).

(*d*) The reed of 6 cubits of a cubit and a handbreadth. Ezek. xl, 5; xliii, 13.

There is something to be gained from this, viz., the cubit after a man was used for measuring the bedstead of Og, while the cubit of a cubit and a handbreadth was used in measuring the buildings of the Temple, *i.e.*, the common cubit for ordinary purposes, the cubit of 7 palms for buildings.

In addition are the following lesser measures:—

The Tupah or palm, strictly meaning "extent." It is not an anatomical word referring to any part of the body; it is translated "handbreadth," and occurs Exod. xxv, 25; Ezek. xl, 5, xliii, 13; 1 Kings vii, 25; 2 Chron. iv, 5; Psalms xxxix, 5.

The Zerith or span, which signifies "expanse," and is not an anatomical word. It is mentioned in Exodus xxviii, 16; 1 Samuel xvii, 4; Isa. xl, 12; Ezek. xliii, 13.

The Atzbah or digit (fingerbreadth), only mentioned in Jer. lii, 21.

As, however, these terms are translated into the Greek

equivalents for palms, spans, and digits respectively in the LXX and Josephus, and are used by the Talmudists in the sense that we use them, for the actual palm, span, and fingerbreadth, it appears quite safe to assume that they actually represented the spaces as they are rendered in the A.V. and R.V.

We find, then, in the earliest times these bodily measures spoken of, not only in the Bible, but in the books of the early writers. Herodotus mentions of the Egyptians :—"An orgia is 6 feet or 4 cubits ; a foot is 4 palms, and a cubit 6 palms" (Euterpe No. 149) ; and of the Babylonians : "The royal cubit exceeds the common cubit by 3 fingerbreadth," and speaks of it in reference to the wall of Babylon (Clio. 78).

There is one peculiarity about these measures of the body, viz., they may vary in different individuals of the Caucasian races, but never to any considerable amount.

Thus 4 fingers go to a handbreadth or palm (*i.e.*, the width of the four fingers across the middle joints), and though the width may vary there must always be four fingers to a palm.

Three palms equal 1 span, and 6 palms 1 cubit, and though this may not be exact in each individual, yet there are never 2 or 4 palms to a span, or 5 or 7 palms to the cubit or forearm of a man.

We may therefore accept with certainty the following table :—

4 fingers	about	1 palm.
3 palms	„	1 span.
6 „	„	1 cubit or forearm.
4 cubits	„	1 height or stature of a man.

The palm is as stated above. The span is the stretch or extent from end of thumb to end of little finger when the fingers are extended, and the cubit is the length of the forearm from the elbow to the end of the middle finger.

It will be found on further investigation that these relative proportions are quite sufficiently correct for ordinary purposes of measurement when accuracy is not required. We may, therefore, deduce roughly the lengths of these different parts, assuming that the height of ordinary men in ancient times from Egypt to Assyria lay between 5 feet 2 inches and 6 feet 2 inches :—

Cubit,	from	16	to	$18\frac{1}{2}$ inches.
Span,	„	8	to	$9\frac{1}{2}$ „
Palm,	„	$2\frac{2}{3}$	to	$3\frac{1}{12}$ „
Digit,	„	$\frac{7}{36}$	to	$\frac{13}{48}$ „

Some authorities have endeavoured to obtain the length of the cubit from the breadth of the barleycorn, reckoning according to the Talmudists, 144 corns to a cubit, but as the cubit, span, and palm must have been in use in the earliest times, long before the measurement of barleycorns can have been thought of, it does not seem probable that an attempt to ascertain the length of the cubit from the barleycorn could materially assist, and it might possibly entirely draw one away from the truth. Moreover, the measurements of the barleycorn have given rise to greater discrepancy in the length of the cubit than before existed, as will be seen from the following results of the measurements of 144 barleycorns (I have not been able to ascertain where the Talmudists state there were 144 barleycorns to a cubit[1]):—

Conder's "Handbook to Bible" ..	13·68	inches (inferred).
Watson (P. E. *Quarterly*, 1897) ..	17·7	,,
"Penny Cyclopædia" (xviii, 698) ..	18·9	,,
"Smith's Bible Dictionary" ..	19·6	,,

In any case, if the barleycorn test is to be relied upon, it requires a much more extended investigation than it has received at present. Colonel Watson, however, with Syrian barley, and with very careful measurements, has arrived at a length for the common cubit which seems closely in accord with that which has been derived in many other ways, and with the cubit as I deduce it.

The safest plan for ascertaining the original length of the common cubit is to ascertain as nearly as possible the height of the people of the East in early days, and deduce the cubit from their stature.

It is, however, to be observed that it is not at all probable that the cubit was derived from the average height of men (as it would be in the present day), but rather from the taller of the average, the fighting men. The men in robust health and conspicuous among their fellows, but yet not out of the common.

Attention has been paid in recent years to the height of the Jews in Poland, and it has been ascertained that although the Jewish population of Central Europe at the present day is notably

[1] *See* Arias Montanus ("Ant.," p. 113), and the works of the Arabians, Muhammed Ibn Mesoud and Aly Kushgy, and the "Geographia Nubiensis," printed in Arabic at Rome.

undersized compared with the general population of Northern and Central Europe, there is reason for supposing that they were not a diminutive race in early days, although in the sight of the sons of Anak they felt as grasshoppers (Numbers xiii, 33).

Their average for men throughout Europe at the present day is 5 feet 4 inches (1·63 met.), and their stunted condition is attributed to their environment: their confinement for ages to the Ghetto. Give them a fair chance and they soon develop their stature.

In Poland they vary according to density of population from 5 feet 3 inches to 5 feet 5 inches ("Pol. Science Monthly," vol. 53, p. 171). The prosperous Jews of London surpass their East End brethren by more than 3 inches ("Jacobs," 1889, p. 81), but never seem to surpass the height of 5 feet 9 inches. It appears then that when the Jew is given a fair chance he speedily recovers a part at least of the ground lost during many ages of social persecution.

When we turn to the East, we find at the present day that the Semites in Arabia and Africa are all of goodly size, far above the Jewish average ("Collignon," 1887, p. 221; "Bertholon," 1892, p. 41). In Persia and Syria the Semites (the Jews included) are not stunted; some are well grown, others even tall.

It may be suggested, then, that the average man among the Semites ranged in stature from 5 feet 7 inches to 5 feet 11 inches, and that the greater of these two heights was taken as four times the cubit, viz., 17·75 inches. This is, of course, but a shot at the truth, but it should be observed that the limit of range is very slight, amounting to 1 inch for the heights 5 feet 7 inches to 5 feet 11 inches, viz., 16·75 inches to 17·75 inches.

With this length of 17·75 inches for the common cubit, Goliath at 6 cubits and 1 span would have measured 9 feet 7·3 inches. The bedstead of Og (9 × 4 cubits) would have measured 13 feet 3·75 inches × 5 feet 11 inches.

I think that we may safely assume that the common cubit was about 17·75 inches, as it accords with all indications. The cubit of 7 palms of about 20·6 inches gives a common cubit of 6 palms of about 17·64 inches.

III.—The Building Cubit.

The question now arises how the common cubit of 6 spans developed into a cubit of 7 spans in all early buildings in the East, and even in Europe.

We have no occasion to assume that it was used for anything but building purposes, because it is from the buildings only that we obtain it; for other purposes, such as measuring land, cubic content, &c., the common cubit, or any other cubit, may have been used of convenient length. Just as now, in our own country, we use feet and inches for linear measure, and links and chains for land measure. It will appear, however, that the cubit of 20·6 + was used for square measure and measures of capacity.

It has been suggested that the building cubit was used only for royal or sacred buildings, such as palaces, temples, &c. This may have been so, but as only the royal and sacred buildings have stood the wear of time, we cannot be certain if it were so, but in any case there must have been some good solid reason why in building palaces, temples, pyramids, &c., the common cubit of 6 palms was discarded, and a cubit of 7 palms adopted, and the reason will be shortly proposed.

In erecting buildings of the beautiful finish and accurate proportions of the Great Pyramid, designs were required and elaborate calculations had to be made.

The stones, we know, were quarried and cut into shape far away from the Pyramid, and were then brought and laid together, and were required to be so cut that they would exactly fit together. This necessitated an intimate knowledge of some branches of geometry, applicable to the condition of mathematical knowledge in those early days.

A method of calculating cubic content was required, and the necessity must have arisen at a very early period for a means of turning circular into square measure, and square into circular measure, to calculate the weight of columns, and also for measuring capacities of various kinds.

The relations of a circle to a square would thus have attracted very early attention, and the content of a circle in square measure would probably have been approximated to with some accuracy long before the result could be expressed by symbols.

It is easy for an average workman, even with primitive instruments, to strike out a circle from some stuff of uniform weight

and thickness, as, for example, a hide or metal plate, and to balance its weight against a similar piece cut square. At a very early period this would have given fairly accurately (if carefully done) the relation between a circle and a square of the same area, between the diameter of one and the side of the other; and also by repeated trials it could have been ascertained that the circumference of a circle exceeds the length of the diameter by something over 3, which can be measured.

De Morgan relates in "A Budget of Paradoxes" that two values of π were obtained by actual measurement by artisans, 3·125 and 3·1406. The second result was obtained by a joiner in 1863 by means of a disc, of 12 inches diameter, rolling upon a straight rail. The mechanics in early days could have worked quite as accurately, and as the value of π thus obtained is as much under as the values given by Archimedes both under and over, viz., $3\frac{1}{7}$ and $3\frac{10}{71}$, we may be quite sure that the ancients were able to make a very close approximation to the truth by practical trials.

In a similar manner there would be no difficulty in obtaining the relative capacities of cylinders, cubes, pyramids, and cones.

The natural height of a cylinder would be that of the radius of the circle on which it is based, as with the height of a cube it is the length of the side. With the pyramid and cone there may be a different opinion as to the height to be taken, but the height that actually was taken was the radius of the perimeter circle of the pyramid base.

By taking a cube of a standard dimension, say a cubit of 6 palms, they could readily ascertain to within a close approximation the radius and height of cylinders, pyramids, and cones that would hold the same amount of water. Probably they would arrive at a correct solution, much within 10 per cent. of the truth, without any great difficulty or number of trials. Their great difficulty would be in expressing these dimensions accurately without the use of decimals.

They were not quite ignorant of the decimal system, as it is generally agreed that all nations (with a few trivial exceptions) count in terms of five or multiples of five, and that the counting by sets of tens developed into the use of the swanpan or abacus, an instrument which is known to have been used amongst the Egyptians, Etruscans, Greeks, Hindoos, Chinese, and Mexicans. Whether it was invented independently at several centres, or

came from one centre, is immaterial. If it was invented independently at several centres, it shows a disposition in the human mind to work in tens, probably from the ten fingers; if it came from one centre, that centre was certainly either Egypt or Assyria.

The first attempts at deducing the dimensions of their cylinders, cones, and pyramids in connection with their standard cube would no doubt have reference to their cubit of 6 palms.

The first problem would be to obtain an expression for the circumference of a circle in terms of the diameter, and they naturally would for this purpose take a cubit or half a cubit as the diameter. These give—

Diameter 6, circumference $19 = \frac{19}{6}$ .. .. 3·166̇

„ 3, „ $9\frac{1}{2} = \frac{19}{6}$

as a near approximation to π. No other numbers below 20 will give so near an approach.

Diameter 5, circumference 16 .. .. .. 3·18

„ 4, „ 13 .. .. .. 3·25

The relation of 7 to 22 falls outside 20, and will be referred to subsequently.

That this number 6 was the original diameter may be accepted as probable, because in the Hieretic Papyrus of the Rhind collection in the British Museum (written by an Egyptian priest named Ahmes, 1700 to 1100 B.C., and supposed to be taken from an older treatise of about 3400 B.C.), it is stated as one of the geometrical problems, "to find the surface of a circular area whose diameter is 6 units" (Allman's "Greek Geometry," p. 16).

We thus find a connection in the first onset between 6 and $9\frac{1}{2}$, which will appear of greater importance hereafter, because of the fact that the cube of 6 is very nearly the fourth part of the cube of $9\frac{1}{2}$; $6^3 = 216$; $(9\frac{1}{2})^3/4 = 214\frac{1}{32}$. So that for practical purposes 6 is equal to $9\frac{1}{2} \div \sqrt[3]{4}$.

This was a valuable relation which it will be seen lay at the root of the connection of their measures of capacity. Subsequently they found other relations such as $(14)^3 : (6\frac{1}{2})^3 :: 10 : 1$ $(6\frac{1}{2})^3 : (4\frac{1}{2})^3 :: 3 : 1$, which led to the origin of the Babylonian and Hebrew weights and measures.

There is a peculiarity about this first deduction of the value

of π, which I call attention to. $\frac{19}{6}$, if reversed and used as π, becomes $\frac{60}{19} = 3{\cdot}157$, and the two multiplied together $3{\cdot}157 + \times 3{\cdot}16 = 10$, $\frac{60}{19} \times \frac{19}{6} = 10$. That is to say, the square of the values of π was 10, assuming that $\frac{60}{19}$ are considered equal to $\frac{19}{6}$.

The Hindoo writer, Brahmagupta (about 650 A.D.), in his attempt to rectify the circle, gives as his result $\sqrt{10} = \pi$, and the origin of his geometry is ascribed to the works of Hero of Alexandria (B.C. 125), so that this view may have come from the Egyptians.

I append at the end of this chapter a table showing the values of π for radii from 3 to 9, with their equivalents in decimals. From this it will be seen that the first really workable number for a good value of π is 7, by which $\pi = \frac{22}{7} = 3{\cdot}1428 +$.

It has been shown that a good workman could approximate to the value of π practically to 3·1406, which is about the same amount in error on the other side of true π, and the two are nearly the limits given by Archimedes—$3\frac{1}{7}$ and $3\frac{10}{71}$.

In continuing their trials of the relative capacities of cubes, cylinders, cones, and pyramids, they made the grand discovery that a cube of 7 palms was half the capacity of a cylinder of radius and height of 6 palms; and that the pyramid $2 \times 7\frac{1}{2}$ palms base and $9\frac{1}{2}$ palms high, and the cone of $8\frac{1}{2}$ palms base radius and $9\frac{1}{2}$ palms high, were to the cylinder of radius and height 6 palms as $\left(\frac{44}{25}\right)^2$ to 3.

Again, they found that a cube of 14 palms was equal to a cylinder of $9\frac{1}{2}$ palms height and radius, and that these two were four times the capacity of the four smaller measures above mentioned, this connection depending upon the fact that $9\frac{1}{2}$ nearly equal $6\sqrt[3]{4}$.

They would thus by these experiments arrive at a diameter of 7 palms, with a circumference of 22 palms, as the most convenient number to use in connection with circular and square measure, in lieu of the original diameter of 6 palms and circumference of $9\frac{1}{2}$.

It appears to me that they arrived at their value of π

$\left(\text{viz., } \frac{22}{7}\right)$ as a result of their practical measurement of cubes in relation to cylinders, &c., and not by any such test as Archimedes used—of the inner and outer polygon; the geometry of the Egyptians having apparently been confined to the relation of numbers to each other through areas and solids.

In recapitulating the measures now arrived at, I must give a name to the larger measure, and call it, for want of another name, an *Egyptian chest*, the smaller measure naturally being called a quarter.

		Cubic Palms.
a.	A cylinder of $9\frac{1}{2}$ palms radius and height	2,745·5, 1 chest.
	A cube of 14 palms a side ..	2,744, 1 chest.
	A box $17 \times 17 \times 9\frac{1}{2}$	2,745·5.
b.	A cylinder of 6 palms radius and height	679, 1 quarter.
	Two cubes of 7 palms a side ..	686, 1 quarter.
c.	A pyramid of $(2 \times 7\frac{1}{2}$ palms base)^2 and $9\frac{1}{2}$ palms height	712, 1 quarter.
	A cone of $8\frac{1}{2}$ palms base radius, and height $9\frac{1}{2}$	712, 1 quarter.

In using the latter two (to measure quarters) a correction would be required, of which mention will be made hereafter.

There will thus be seen a good reason for the adoption of the 7-palm cubit in all matters connected with buildings and measures where squares were required to be turned into circles and the reverse; both because the cube on 2×7 became thus the standard measure of capacity, and because 7 became the diameter of the circle to circumference 22. It is to be recollected that with us at the present day all circles are alike, only to different scale; but to the ancients, owing to their different values of π (in each case necessitated by their adhering to whole numbers), the ratio of circumference of the circles differed according to the diameter.

In turning circular measure into square measure, the ancients could not, of course, restrict themselves to *one* value of π; they were obliged to adopt several values so as to keep to whole numbers, and thus their results could never quite accord, but it was the only possible system they could adopt without decimals.

I suppose that they had some limit of error, but it is quite astonishing how closely they could arrive near the truth by selecting appropriate numbers.

This difficulty of adjusting the errors caused by taking whole numbers must have continually impeded their work, and no doubt they were always on the look out for some nearer approach to π, but they never got nearer, so far as expressing it is concerned, than $\frac{22}{7}$.

There are many numbers which, if used with appropriate values of π, give whole numbers for circumference, radii, and sides and areas; but these almost in all cases only give rectangles, and not perfect squares, for the areas. It was only by an artifice, viz., skew or false roots, that they could arrive at squaring the circle, and then it was only an apparently true result, the error being the amount due to the incorrect value of the use of π and $\sqrt{\pi}$. If, however, these values are taken and the values in the standard office of our national standard, it will be found that their simple, ready method was quite as accurate in practical results as our own.

It is to be recollected that an error of 6 per cent. in a content is reduced to an error of 2 per cent. in the sides when evenly distributed, and in an ordinary measure such an error can scarcely be detected.

I now give the original values of π up to radius 9, observing, however, that it does not follow that there are convenient square roots of π available for use:—

Circumference =	Radius.	Area.	
$\frac{19}{6} \times 2.3 = 19$	3	$\frac{19}{6} \times 9 = 28{\cdot}5.$	$\pi = 3{\cdot}1\dot{6}.$
$\frac{25}{8} \times 2.4 = 25$	4	$\frac{25}{8} \times 16 = 50.$	$\pi = 3{\cdot}125.$
$\frac{16}{5} \times 2.5 = 32$	5	$\frac{16}{5} \times 25 = 80.$	$\pi = 3{\cdot}20.$
$\frac{19}{6} \times 2.6 = 38$	6	$\frac{19}{6} \times 36 = 114.$	$\pi = 3{\cdot}1\dot{6}.$
$\frac{22}{7} \times 2.7 = 44$	7	$\frac{22}{7} \times 49 = 154.$	$\pi = 3{\cdot}142+.$
$\frac{25}{8} \times 2.8 = 50$	8	$\frac{25}{8} \times 64 = 200.$	$\pi = 3{\cdot}12.$
$\frac{19}{6} \times 2.9 = 57$	9	$\frac{19}{6} \times 81 =$ no whole number.	

IV.—First Attempts at Squaring the Circle and the Interesting Results.

Whilst these practical investigations were going on regarding the various measures of capacity, they were naturally led to inquire into the cause of the various coincidences which the theory of numbers renders so numerous, and they made constant attempts to square the circle: *i.e.*, to find some numbers which, while giving a whole number for the area, would give also whole numbers for the circumference, radii, and sides of the square.

The practical results of the trials mentioned would now come in useful, and they found that a circle whose radius was $2 \times 9\frac{1}{2}$ had a side of a square for its area of $4 \times 8\frac{1}{2}$ as follows:—

$$(2 \times 9\tfrac{1}{2})^2 \times \frac{60}{19} = 1{,}150.$$
$$(4 \times 8\tfrac{1}{2})^2 \qquad = 1{,}156.$$

Again, they found that a circle whose radius was $2 \times 8\frac{1}{2}$ had a square side of $4 \times 7\frac{1}{2}$ as follows:—

$$(17)^2 \times \frac{60}{19} = 901\tfrac{5}{9}.$$
$$(30^2) \qquad = 900.$$

In the first case the error is less than 6 per 1,000, in the second case less than 3 per 2,000, with their value of π.

They then made the important discovery that these two circles had a distinct relation one to the other, viz., that by taking the base of $4 \times 7\frac{1}{2}$ as the side of a square, the perimeter was the circumference of a circle whose radius was $2 \times 9\frac{1}{2}$.

In other words that these two circles are the perimeter and area circles formed from a square whose base is $30 = (4 \times 7\frac{1}{2})$.

This was a great discovery and seems to have been sealed up in Egypt, as there is no record of its being known to the Greeks or Romans.

This led to a further remarkable discovery, which was of the greatest service to them, as they were on the look-out for fractions which could be taken for the $\sqrt{\pi}$.

If certain functions (circumference, radii, sides, and areas) of the two circles above mentioned are put down in two lines, so that those of the area circle are uppermost, it will be found that the fractions formed respectively by the numerators when multiplied

by two give 2 skew roots to the value of E π, which multiplied together makes E π. E π = Egyptian value of π.

I first noticed this feature in the circles drawn from the base of the Great Pyramid. At first I was amazed at the ingenuity of the ancients in squaring the circle, but it now appears that they arrived at their results simply through the use of this criss-cross formula. I suppose that they arrived at this formula, just as I did, by putting the numbers down in order and then finding that the fractions are the same (the numerators being doubled) as the skew roots of π.

Example.

		Circumference.	Radius.	Side.	Area.
Circles from square of $(30)^2$ ..	a	$2 \times 8\frac{1}{2}$	$4 \times 7\frac{1}{2}$	$(4 \times 7\frac{1}{2})^2$	area circle.
	b	$2 \times 9\frac{1}{2}$	$4 \times 8\frac{1}{2}$	$(4 \times 8\frac{1}{2})^2$	perimeter circle.

Fractions obtained—

$$\frac{17 \times 2}{19} \times \frac{30 \times 2}{34} = \frac{60}{19} = \text{E}\pi = 3{\cdot}15 +.$$

$$\sqrt{\pi_a} = \frac{34}{19} = 1{\cdot}789 +.$$

$$\sqrt{\pi_b} = \frac{30}{17} = 1{\cdot}764 +.$$

In order to show that the system I am bringing forward is in keeping with the views of the ancient Egyptians, I refer again to the writings of Ahmes, the Egyptian, in the Papyrus of the Rhind collection.

Ahmes states that a circle can be squared by taking eight parts of a diameter of nine parts, and erecting a square on the eight. This is equivalent to using $\left(\frac{4}{3}\right)^4$ as π—a bad value for π, but a very convenient value for dealing with, as it has a square root of whole numbers $\left(\frac{4}{3}\right)^2$.

$$\text{E}\pi\, r^2 = 8^2. \quad r = 4{\cdot}5.$$

$$\text{E}\pi = \left(\frac{8}{4{\cdot}5}\right)^2 = \left(\frac{4}{3}\right)^4 = 3{\cdot}1604.$$

This value of π approximates very closely $\left(\frac{512}{162} \text{ and } \frac{513}{162}, \text{ difference } \frac{1}{512}\right)$ to that $\left(\frac{19}{6}\right)$ which I have already given as the *first* approxi-

mation to π in the original circle of which 3 or 6 was the diameter.

They differ, however, in that $\left(\frac{4}{3}\right)^4$ has the true root of $\left(\frac{4}{3}\right)^2$ in whole numbers, while $\frac{19}{6}$ has only the skew roots of $\frac{19}{11} \times \frac{11}{6} = \frac{19}{6}$, which are rather too far apart for practical use.

This diameter of Ahmes is a multiple of 3.

I now give an example of the two circles arising from the action of Ahmes in erecting a square on eight parts of the diameter of a circle, showing that the radii and sides are respectively to each other as 9 : 8, and that the areas are to each other as 81 : 64, making use of $\left(\frac{4}{3}\right)^4$ as value for π. In order to retain whole numbers the diameter is divided into (9 × 32 =) 288 parts, of which (8 × 32 =) 256 are taken for side of square.

Circumference.		Radius.	
$1{,}026 = \frac{256}{81} \times 2r$		162	9
$\frac{16 \times 256}{9} = \frac{256}{81} \times 2r$		144	8
$E\pi r^2 = \frac{256}{81} \times (162)^2 = 9^2 \times 32^2$			81
$E\pi r^2 = \frac{256}{81} \times (144)^2 = 8^2 \times 32^2$			64

It will be seen from the above that this square and circle of Ahmes produce two perfect squares of ratio 81 to 64, the sides being as 9 : 8.

Now if we put the radii and sides down according to the formula already given, we have—

$$\text{Radius, } \frac{144}{162}. \qquad \text{Side, } \frac{8 \times 32}{9 \times 32}.$$

Fractions for roots—

$$\frac{288}{162} \times \frac{8 \times 32 \times 2}{9 \times 32} = \frac{16}{9} \times \frac{16}{9} = \left(\frac{4}{3}\right)^4.$$

It will thus be seen that this problem of Ahmes is quite in accord with those already given. There will be other problems of Ahmes to bring forward.

V.—The Relations of the Two Circles derived from a Square when the Circumference of the Perimeter Circle $= \sqrt{\pi} \times a$.

So far we have only arrived at squaring the two circles, or obtaining two circles from a square, by use of rather inefficient values of π, and little progress could be made.

The next step was a very important one, viz., the employment of a number closely approximating to $\sqrt{\pi}$ multiplied by 10 or 100, and used as the circumference of the perimeter circle derived from a square.

I will first give the values according to true π, and then it can be seen how near to the truth the Egyptians arrived by their method.

Circumference.	Radius.	Area.	Side.
Area circle π . 50·0	25·0	$\pi \times \left(\frac{5}{2}\right)^2 \times 100 = \frac{\pi \,.\, 2{,}500}{4}$	$50 \,.\, \frac{\sqrt{\pi}}{2}$.
Perimeter circle $\sqrt{\pi}$. 100	$\frac{25{\cdot}0 \times 2}{\sqrt{\pi}}$	$\pi \times \frac{50}{\sqrt{\pi}} \times \frac{50}{\sqrt{\pi}} = 2{,}500$	50
Area circle π . 50	25·0	1,963·49	44·3 × 2
Perimeter circle $\sqrt{\pi}$. 100	28·2 +	2,500·00	50·0

Now—

$$\frac{50}{28{\cdot}2+} = \sqrt{\pi} \text{ and } \frac{88{\cdot}64+}{50} = \sqrt{\pi}. \quad \therefore \frac{50}{28{\cdot}2+} \times \frac{88{\cdot}64}{50} = \pi.$$

Giving a ratio of the sides and radii respectively as 100 : 88·64 +.

I was at first puzzled as to how they made the discovery of using an approximation to the value of $\sqrt{\pi} \times a$ as a circumference of the perimeter circle, but since finding out the criss-cross arrangements of the fractions, it seems to me that they were led up to it naturally by the theory of numbers.

Whether they found this out with the perimeter circle of 3, 6, or 9 diameter does not seem certain ; I rather think that they did, but it was of little value to them until they made the area of the perimeter of the circle a multiple of 25.

But what particularly puzzled me was that in taking $\frac{22}{7}$ as the value of π there was no root to be obtained, and though I had arrived at the skew roots $\frac{44}{25} \times \frac{25}{14}$ incidentally, I could not imagine how the Egyptians had come across them without knowing the true value of π.

I think that this is what has puzzled so many investigators, and has led to the supposition that the Egyptians knew the true values of π and $\sqrt{\pi}$. I am convinced that they could express nothing nearer the value of π than $\frac{22}{7}$, but they possessed, as I have shown, a machinery, a sort of mill, into which they put the problems, and by the criss-cross arrangement already indicated they found out whether the numbers were suitable.

At the onset they would be checked in the use of the $\sqrt{\pi} \times a$ for a circumference: until they found out that having put an incorrect value of $\sqrt{\pi}$ they must correct it by using a reciprocally incorrect value of $\sqrt{\pi}$ in getting out the area. This they arrived at readily by the criss-cross arrangement.

The artifice used is exceedingly ingenious and brings very correct results.

Let—

$$\frac{44}{25} = \sqrt{\pi_a} \text{ and } \frac{25}{14} = \sqrt{\pi_b}. \quad \frac{44}{25} \cdot \frac{44}{25} = \pi_a, \frac{25}{14} \cdot \frac{25}{14} \cdot \pi_b.$$

$$\frac{22}{7} = \pi_{a.b}.$$

Now, in the circle of which $1{\cdot}76 \times a$ is circumference—

$$\sqrt{\pi_a} = 1{\cdot}76 \quad 176 = 1{\cdot}76 \times 100 = \sqrt{\pi_a} \times 100.$$

$$\sqrt{\pi_b} = 1{\cdot}78+ \quad r = \frac{\text{circ.}}{2 \cdot \sqrt{\pi_a}\sqrt{\pi_b}} = \frac{\sqrt{\pi_a} \times 100}{2\sqrt{\pi_a} \cdot \sqrt{\pi_b}} = \frac{50}{\sqrt{\pi_b}}.$$

The artifice which at first seemed to me so shrewd consists that in squaring $r = \frac{50}{\sqrt{\pi_b}}$, $\sqrt{\pi_a}$ is substituted for one $\sqrt{\pi_b}$.

Thus—

$$r^2 = \frac{50}{\sqrt{\pi_b}} \times \frac{50}{\sqrt{\pi_a}} = \frac{(50)^2}{\pi_{ab}}.$$

This substitution eliminates the original error of making $1{\cdot}76$ act for true $\sqrt{\pi}$.

So that—

$$\text{area} = \sqrt{\pi_a} \times \sqrt{\pi_b} \times \frac{50}{\sqrt{\pi_a}} \times \frac{50}{\sqrt{\pi_b}} = (50)^2.$$

The same is done also in the area circle, and the criss-cross arrangement of the two circles stands thus, giving whole numbers for one circumference, and all the radii and sides; the other circumference is not required in the computations :—

Circumference.	Radius.		Area.	Side.
$\frac{1100}{7}$	25	$\frac{44}{25} \cdot \frac{44}{25} \times 25 \times 25 = 1{,}936$		44
$100 \times 1{\cdot}76 = 2 \cdot \frac{22}{7} \times 28$	28	$\frac{25}{14} \cdot \frac{25}{14} \times 28 \times 28 = 2{,}500$		50

Now double the upper radius and side and we have the fractions $\frac{25}{14} \times \frac{44}{25} = \frac{22}{7}$.

How they happened to hit upon a square of 44 is still an interesting enigma; probably from taking a circle with a radius 28, which gives an area of 2,500 and another circle with a radius of 25. This, however, may be considered the highest point to which the ancient could arrive without decimals. A square on base 44, whose radius was 25, whose perimeter was $\sqrt{\pi_a} \times 100$. The radius of the perimeter circle 28 and the area 50 square.

This was a great discovery, but they did not rest here.

VI.—The Change in the System of Numeration for Measures of Capacity.

The next step was one of great magnitude and of important consequences—nothing less than changing their units of measures. There were strong reasons for this addition, which will appear further on. At present I will only allude to the difficulties of manipulating such figures as $7\frac{1}{2}$, $8\frac{1}{2}$, and $9\frac{1}{2}$.

What they did was to substitute the numbers in the circles whose area base is 44 for the numbers whose area base is $4 \times 7\frac{1}{2}$.

Radii.	Bases.
$2 \times 8\frac{1}{2}$	$4 \times 7\frac{1}{2}$
$\lvert 2 \times 9\frac{1}{2} \rvert$	$\lvert 4 \times 8\frac{1}{2} \rvert$
25	44
28	50

This could not be done without affecting the value of the cubit throughout, and the result was somewhat as follows:—

Palms.	New Units.
6	17·7 (about) $= 10\sqrt{\frac{22}{7}}$.
7	20·6 (about)
$7\frac{1}{2}$	22
$8\frac{1}{2}$	25
$9\frac{1}{2}$	28
14	41·2 (about)

The result of this was to make irregular distances between the different units, for it will be seen by the attached table (I) that none of these numbers exactly correspond. Thus, between 22, 25, and 28 there should be 2·94 inches, and there is 3·00, while the amount between 20·6 + and 22 should be 1·47 inches, and it is less than 1·4 inches.

It will be observed the numbers are in British inches: this may be a coincidence or not—*i.e.*, the British inch may be the direct descendant of the pyramid unit, or it may have diverged from it and accidentally come back again; but as a matter of fact, it will be shown there is no practical distinction between the two.

I will now show the great effect of this change on the measures of capacity. I have shown that the cube of 14 palms is $343 \times 8 = 2{,}744$ palms. The new system gives 70,044·16 for the cube of 14 palms, and 70,000 for the cylinder 28 units in height and radius.

$$176 \quad 28 \quad (50)^2 = 2500$$
$$28$$
$$\overline{70{,}000}$$

70,000 seems to be a likely number to be adopted for the units in a standard measure, as there was a tendency to use multiples of 7 in early days. There are numerous cases of this in the Old Testament. F. Petrie (p. 83, "Pyramids of Gizeh") states that the stones in the Pyramid average $(50)^2 \times 28 = 70{,}000$ cubic inches each; this may be merely a coincidence.

VII.—The New Pyramid Basis for Units of Capacity.

In dealing with the new units I wish to point out that the subject has nothing whatever to do with the fact of the British inch happening to coincide with the pyramid inch. In fact, I found this close coincidence so embarrassing and confusing that I have been obliged to do some of the calculations in foreign measures.

The whole system is based on the Egyptian value of $\pi = \frac{22}{7}$. The square root of this is taken, and is raised to the fifth power and multiplied by $(10)^3$. This is the number of units in one quarter of the Egyptian chest: it amounts to 14,511·04 units, and the whole chest contains 70,044·16 units.

Now this chest is 14 palms cube, and $\sqrt[3]{70{,}044{\cdot}16} = \frac{2)41{\cdot}2215}{20{\cdot}6107}$ pyramid inches; while, as will be seen shortly, the double cubit from the measurement of the Pyramid is 41·22181 British inches.

The pyramid cubit is therefore in pyramid inches..	20·6107
In British inches	20·6109
(*See* pp. 220 and 250.) Giving a difference of ..	·0002

The reason why the fifth power of $\sqrt{\frac{22}{7}}$ was taken can now be seen. $10 \times \sqrt{\frac{22}{7}}$ pyramid units has been substituted for 6 palms, and a cylinder of $10 \times \sqrt{\frac{22}{7}}$ radius and height $= \left(\sqrt{\frac{22}{7}}\right)^5 (10)^3$. This is irrespective of any value of the British inch, and would be the same if taken in metres or toises. I now append a table showing the palms and cubits according to the linear measure, and the changes that have been made to suit the measures of capacity, and I now give these measures of capacity:—

		Cubic inches.
a.	A double cubit of 20·6107 cubed	70,044·16
	A cylinder 28 inches radius and height (68,992)	70,000·0
	A chest or box, 50 × 50 × 28 inches	70,000·0

		Cubic inches.
b.	A cylinder $\sqrt{\frac{22}{7}} \times 10$ radius and height =	
	$\left(\frac{22}{7}\right)^{\frac{5}{2}} \times (10)^3$	17,511·01
	Two cubes of 20·610909 inches a side	17,511·01
	A cube of 26 inches	17,576·0
c.	A pyramid of 44 inches base side and 28 inches high	18,069·0
	A cone of 25 inches base radius and 28 inches high	18,330·0

VIII.—The Measurements of the Great Pyramid.

At least four different cubits have been derived from these measurements:—

(1) 20·6 + British inches. This is the ancient Egyptian cubit. Proposed by most authorities from Sir Isaac Newton to the present day.

(2) $10\sqrt{\pi} = 17{\cdot}72 +$. Proposed by Samuel Beswick, C.E.

(3) 25· pyramid inches. Proposed by Piazzi Smyth.

(4) 18·24 British inches. Proposed as a land measure by Sir Henry James.

2, 3, and 4 are in one manner or another closely connected with the building cubit of 20·6 + inches, and cannot be separated from it.

(2) $\sqrt{\pi} = 1{\cdot}77245$ and $\sqrt{\frac{22}{7}} = 1{\cdot}77281$. If these be multiplied by 10 inches we have two cubits of 17·7245 and 17·7281, only differing from each other by ·0036 inch.

So that Mr. Beswick comes very near to the base of the system, but he used it as a cubit for measuring the pyramid instead of the building cubit of 20·6 + inches which is derived from it.

(3) The 25· British inches cubit is one of the cubits derived from the base $\frac{22}{7}$. They consist of—

7 palms, 20·6 + inches.
$7\frac{1}{2}$ palms, 22·08 +.
$8\frac{1}{2}$ palms, 25·027 +.
$9\frac{1}{2}$ palms, 27·97 +.

The three latter are for all practical purposes 22, 25, and 28 inches in length, and these numbers would in many instances give as good results in the smaller dimensions as the building cubit, 20·6 + inches.

(4) The 18·24 British inches cubit is derived in another manner. The account of it will be found in "Papers of Royal Society," 1873, p. 407. Sir Henry James assumes the base of the Pyramid to be 500 cubits, and to measure 9,120 British inches; this gives a cubit of 18·24 inches; and as the measurement of the base of the Pyramid is now corrected to 9,068·8 inches, it would now give a cubit of 18·137 inches.

He gives the proportions 100 : 88, though he does not mention how he arrived at them, and taking a royal cubit at 20·727 inches, he gets 18·24 inches as follows:—

$$100 : 88 :: 20{\cdot}727 : x = 18{\cdot}23976 \text{ inches.}$$

It is interesting to find that this is the correct proportion. It comes from the ratio of the two sides of the area circles of the Pyramid base—

$$500 : 440 :: 100 : 88$$

and the length of the cubit can be arrived at as follows:—

$$100 : 88 :: 20{\cdot}6109 : 18{\cdot}137072.$$

It can also be obtained by dividing the length of the Pyramid base 9,068·8 inches by 500 = 18·137. It seems possible that there may have been in use in Egypt a special unit for land measure, just as there was one for measures of capacity, and as there is now for our English land measure: 100 links to 66 feet; in this latter case, as will be shown, the cubit seems to be 19·8 inches.

Whether the measurements of the Pyramid by Piazzi Smyth, Flinders Petrie, or any other investigator, are examined, it is quite evident to any one accustomed to building operations that the building cubit was about 20·6 inches. This can be deduced from the dimensions of the King's Chamber, 412·25 inches by 206·13 inches (20 × 10 cubits) and from the constant use of multiples of this number of inches throughout the Pyramid. Flinders Petrie's measurements are, however, the first to give us a really accurate basis of calculation for length of this cubit, from the real base of the Pyramid, although he does not use it himself, and relies upon small measurements in the King's Chamber. The length of cubit he deduces from the four sides of the King's

Chamber is 20·632 ± 004 inches, but this is not the deduction to be made from his mean measurements, recorded on p. 27, "Pyramids and Temples of Gizeh." They run :—

412·40
206·29
412·11
205·97

60)1236·77

20·613

giving a cubit of 20·613 inches.

Petrie lays much stress upon the open joints and cracks in the walls of the King's Chamber, and was obliged to deduct the widths of these cracks from the measurements he made to arrive at the original measurements of the chamber. It was therefore quite impracticable to get at any very near results beyond the fact that the cubit was close on 20·6 inches.

Taking, however, anything between 20·60 and 20·65 inches for the length of the cubit, it can be calculated that 440 is the only whole number that would divide into 9,068·8 inches, as the two extremes are 9,064 and 9,077·2 inches, within which neither 439 or 441 cubits can be obtained. It may then be considered as certain that the cubit lay between 20·6 and 20·65.

There is, however, a more accurate means of obtaining the length of the cubit, and that is by dividing the base of the Pyramid, 9,068·8 inches by 440. This base is 22 times the length of the King's Chamber, and therefore there is a prospect of getting the cubit length to another place of decimals accurately, and the settlements in the Pyramid would not affect materially the rock on which the base is built. The length of base, 9,068·8 inches, divided by 440, gives a cubit of 20·6109 inches. Petrie gives his mean value of base as true within half an inch, allowing of an extreme range for the cubit from 20·6097 to 20·612 inches, thus giving the length to within ·0023 inch. I do not think it practicable to get a nearer approximation to the ancient cubit than this, which amounts to $\frac{1}{10000}$. The cubes of these three sums are :—

$(41·2218)^3 = 70{,}045·7$ inches.
$(41·2194)^3 = 70{,}033·4$ „
$(41·224)^3 = 70{,}056·8$ „

Before, however, accepting the 20·6109 ± ·00115 inches as the exact length of the cubit, let us make quite sure that Petrie measured between the right points.

The rock sockets, in which are the base casings of the Pyramid, are known, and previous to the measurements of Petrie the length of the Pyramid sides was taken from socket to socket. But as these sockets are on different levels, the ground being uneven, no really accurate results could be obtained.

Petrie has shown clearly that these sockets (although they held the casing corner stones) do not indicate the terminals of the base sides, as there was a level pavement some inches above, and the actual base of the Pyramid, as exposed to view when it was completed, was on one level along the surface of this pavement. The accuracy of the length of base given by Petrie must therefore depend upon the level at which he puts this pavement.

His measurements from socket to socket (9,125·9 inches taken as a mean) accord closely with the best of the later measurements, lying between 9,120 of the Ordnance Surveyors and 9,142 of Piazzi Smyth; we may therefore be confident of his length, provided he assumed a right level for the pavement and a correct angle for the slope of the Pyramid; about this latter there can be no doubt, as will be shown.

The slope is 28 perpendicular to 22 horizontal, so that a mistake in the level of the pavement of an inch would cause an increase or decrease in the length of the base side of about 1·4 inches. Petrie had the work of the former explorers to guide him concerning the position of this pavement; and there is also still existing a magnificent basalt pavement covering more than a third of an acre close at hand, which must have been very nearly on a level with the limestone pavement around the Pyramid. His calculation arrives at the result that this basalt pavement was 2 inches above the level of the pavement around the Pyramid. This basalt pavement was taken by him as zero point, and the socket levels with reference to it are:—N.E., − 28·5; S.E., − 39·9; S.W., −23·0; and N.W., − 32·8 inches. From this data, and taking into consideration the distances of the casings from the edges of the sockets, varying from 4·8 to 12·6 inches (Plate VI, "Pyramids and Temples of Gizeh"), I have recalculated the length of the base sides and find them to be 9,069·1, 9,067·4, 9,069·9, and 9,068·7 inches, giving a mean of 9,068·72 inches, varying less than $\frac{1}{10}$ inch from that of Petrie. I think, therefore, his length of base side

may be accepted with confidence as 9,068·8 inches, giving a cubit of 20·61$\dot{0}\dot{9}$ inches ± ·00115, but yet it must not be lost sight of that an error of 1 inch in length of base side either way would increase or reduce the length of the cubit from 20·613 to 20·6086, equal to about 2 in 10,000.

As for the height of the Pyramid all recent authorities are agreed that it bore to the base about the proportion which the radius of a circle has to the circumference.

The height has been estimated by the angle still existing on many of the stone casings, and there is little or no difference of opinion on the subject.

P. Smyth's estimate is from 51° 50′ to 51° 52′ 18″, and Petrie's 51° 52′ ± 2′.

P. Smyth proposes that the Egyptians used for π the proportions 116·3 and 366, giving 3·14703, while $\frac{22}{7}$ gives 3·1428.

Petrie calculates a height of 5,776·6 ± 7 inches, which at 280 cubits in height would give a cubit of 20·628 inches, but his large limit of error would allow the cubit to range between 20·607 and 20·645, and as these limits will not allow of either 279 or 281 cubits, I think it is evident that the height should be 5,770·54 inches or 280 cubits of 20·61$\dot{0}\dot{9}$ inches. Petrie proposes that the builders used the proportion $\frac{22}{7}$ for π, which must necessarily follow from the proportions of the height, 280 to 440 base side.[1]

If now the problem be to find a square whose area, and radius, and perimeter, and area of circle on the perimeter and radius are all whole numbers, I only know of the number indicated by $\frac{22}{7}$, and then only in a certain manner, as below.

In the Pyramid base we have 440 cubits.

Circumference.		Radius.	Side.	Area.
$\frac{11,000}{7}$	$= 2 \cdot \frac{22}{7} \times 250$	440	$\pi_a r^2 = \frac{44}{25} \cdot \frac{44}{25} \cdot 250 \cdot 250 =$	193,600
1,760	$= 2 \cdot \frac{22}{7} \times 280$	500	$\pi_b r^2 = \frac{25}{14} \cdot \frac{25}{14} \cdot 280 \cdot 280 =$	250,000

[1] Sir Henry James, in his notes on the Great Pyramid, published in a pamphlet in 1869, points out that the corner lines rise 9 units in height for every 10 units of horizontal distance along the diagonals. This would be so for all practical purposes with the proportion $\frac{22}{7}$ for π.

This gives radii $\frac{25}{28}$ and sides $\frac{44}{50}$, which are in each case the half of the fractions used for $\sqrt{\pi_a}$ and $\sqrt{\pi_b}$, and these fractions multiplied together make $\pi_{ab} = \frac{22}{7}$.

The circumference $1{,}760 = 4 \times 440$ representing $\sqrt{\pi_a} \times 100$; $\sqrt{\pi_a} = \frac{44}{25} = 1{\cdot}76$.

This is the only possible method, I think, that could be adopted without the use of decimals to obtain whole numbers for the area of these circles, and they are very nearly as if the values are taken by the use of the true value of π and $\sqrt{\pi}$; they are as follows:—

Circumference.	Radius.	Sides.	Area.
1,570·80	249·996	44·3113	196,347
1,772·453	282·09	50·00	250,000

They compare thus:—

Perimeter circle—

	Circumf.	Radius.	Sides.	Area.
True π ..	1,570·80	249·996	443·11	196,347
$\frac{22}{7}$	1,428·5	250·000	440·0	193,600

Area circle—

True π ..	1,772·48	282·09	500·0	250,000
$\frac{22}{7}$	1,760·00	280·00	500·0	250,000

The greatest discrepancy is in the radius 282·09 : 280—about $\frac{8}{1000}$ out, and in the areas 196,347 : 193,600—about $\frac{8}{1000}$ out.

Now, if these circles be made into cylinders by multiplying each by the radius of the perimeter circles we have—

$\frac{22}{7}$ .. .. $250{,}000 \times 280 = 70{,}000{,}000,$

π .. .. $250{,}000 \times 282{\cdot}09 = 70{,}522{,}500,$

or a difference of $\frac{1}{110}$. Again, in the area circle multiply by the same radii—

$\frac{22}{7}$ .. .. $193{,}600 \times 280 = 54{,}208{,}000,$

π .. .. $196{,}347 = 55{,}388{,}535{\cdot}23,$

or a difference of $\frac{1}{50}$, or 2 per cent.

These are, however, only the differences supposing that true π had been used throughout.

The actual variation from the truth for the two solids are as below:—

$$440 \times 440 \times 280 = 54{,}208{,}000\text{; no variation.}$$

$$\text{A variation of about } \tfrac{11}{700} \begin{cases} (280)^3 \times \pi_b \left(\frac{25}{14} \times \frac{25}{14}\right) = 70{,}000{,}000. \\ (280)^3 \times \pi \qquad\qquad\quad = 68{,}929{,}280. \end{cases}$$

The whole content of the Great Pyramid is $\frac{54{,}208{,}000}{3} =$ 18,069,333·3 cubic cubits: if these dimensions be reduced by $10 \times 20{\cdot}6014$ per side, we have a small pyramid of base 44 pyramid units; in fact, a miniature of the Great Pyramid.

Circumference.	Radius.	Side.	Area.
$\frac{1{,}100}{7}$	25	44	1,936
176	28	50	2,500

All expressed in pyramid units.

Now, the length of the cubit in British inches is..	20·6109
And in pyramid units $\sqrt[3]{70{,}000}$	20·6064
Giving a difference between the two cubits of ..	·0045

(*See* pp. 220 and 243.)

By the other method of calculating the pyramid units already given the relation to the British inch is somewhat different: $4\left(\frac{22}{7}\right)^5 \times (10)^3 = 70{,}044{\cdot}12$, which in the form of a cube gives a cubit of 20·6107 pyramid cubits. The mean of these—

	20·6107
	20·6064
	41·2171
Mean	20·6085
Cubit measured in British inches	20·6109
	·0023 (*See* pp. 220 and 243)

differs from the cubit in British inches by something quite inappreciable for practical purposes and short distances.

IX.—Former Theories.

Before proceeding further, it may seem desirable to say a few words on the subject of the various theories on the measurement of the Pyramids.

(1) Mr. Samuel Beswick, in the Palestine Exploration Fund *Quarterly*, and in various papers, states that, according to the canon of proportion, the common cubit was 17·7245385 inches ($= \sqrt{\pi} \times 10$) of 6 spans, and that the royal cubit was 20·6786286 inches of 7 spans.

He assumes that the Egyptians were acquainted with the decimal notation for fractions, and were acquainted with the true values of π and $\sqrt{\pi}$. His views are based on inaccurate measurements of the base side of the Pyramid. He, however, arrived at the conclusion that British inches were identical with pyramid inches, that the coffer was the ancient corn measure, and that the circular area of the perimeter circle of the Pyramid base was a multiple of 25 inches. He lays great stress upon the magical number 515·164, which occurs as a factor throughout the measurements of the Pyramid; not allowing that it is 25 cubits of 20·6065 inches, and must necessarily pervade every measurement.

(2) Professor Piazzi Smyth bases his theories on the view that there are two fixed quantities as factors in the base side of the Pyramid. This requires absolute accuracy in the measurement, and fails as the measurements have been corrected by F. Petrie. There is now no connection between the length of the year in days in the base side of the Pyramid. He, however, is right so far that 25 inches is one of the numbers which will measure the Pyramid base side, in common with 22 and 28. He is also correct in stating that the pyramid units and British inches are almost identical, and also in proposing that the coffer in the King's Chamber is a record of the standard measure of capacity.

(3) Colonel Watson, in his papers in the Palestine Exploration Fund *Quarterly*, 1897 and 1898, though he does not allude in any way to the Great Pyramid or the coffer, brings out the fact that our ancient measures for corn were cylindrical, and that the measure for a quarter of corn was a cylinder of about 17·7 inches in radius and height, or a radius and height of one cubit of

6 palms. And he states that the British measures are given by measures of standard form based on the cubit, and that they, on the other hand, are *not* based on the measures commensurate with the British foot or inch. I have found Colonel Watson's paper most useful in considering the question of the Pyramid measures.

(4) The views I now put forward do not depend upon the Pyramid measurements. The whole of the proportions can be deduced as the solution of a problem, down to the detailed proportions of the coffer, and given the length of the base of the Pyramid in inches, the correct measurements of the coffer can be given by calculation. In other words, we have now the information that the builder of the Pyramid had when he designed the work, and we can give the dimensions which the workmen carried out. So that a coffer can be constructed in this country of the exact measurements given in the design for the original coffer, and the measurements of recent surveys can be tested.

If the base side of the Pyramid has not been given quite correctly, the only effect on the view now put forward would be to alter the length of the cubit, and to alter the relation of the pyramid unit to the British inch, but in other respects there would be no alteration.

X.—The Coffer—Measure of Capacity.

The Problem Stated.

Assuming that the dimensions and proportions of the Great Pyramid indicate the knowledge possessed by the Egyptian wise men as to circular measure and also the shapes and sizes of the ancient corn measures, it is desired to embody this knowledge in one vessel of stone, which shall also be a record of their knowledge of the harmonical progression and of the volume of a sphere.

First, as regards the musical or harmonical progression. Pythagoras discovered, or rediscovered, that with a vibrating string the lengths which give a note, its 5th and its octave are in the ratio $1 : \frac{2}{3} : \frac{1}{2}$, or $6 : 4 : 3$. This it appears was known ages before to the Egyptians and recorded in the stone coffer.

Ahmes, the Egyptian, in the Papyrus (already referred to) of the Rhind collection, tells us of a barn whose linear dimensions are in terms of a, b, c, as follows :—$a \times b \times (c \times \frac{1}{2}c)$. This is one

clue. Put this in form of a harmonic progression, and it becomes—

$$a \times b \times (c + \tfrac{1}{2}c).$$
$$3 \times 4 \times (6 + 3).$$

What is desired is to make a box of this shape, dimensions in palms, to hold the content of four pyramids each $\frac{(15)^2 \times 9\frac{1}{2} \text{ palms}}{3}$ = 2,850 cubic palms. Multiply each factor of the harmonic progression by 3 and it becomes—

Breadth.		Height.		Length.	
9	×	12	×	27	= 2,916.

Thus being 66 in excess of the required amount.

The bulk of this box is to represent $(14)^3$ = 2,744 cubic palms.

Giving 2 palms to the thickness of sides, we have for outside length 31, outside breadth 13, and, if the bottom thickness be $2\frac{1}{4}$, the outside height would be $14\frac{1}{4}$.

The volume over all would therefore be—

$$31 \times 13 \times 14\tfrac{1}{4} = 5{,}742\tfrac{3}{4}$$
$$2{,}850 + 2{,}744 = 5{,}594$$
$$148\tfrac{3}{4}$$

$$5{,}742\tfrac{3}{4}$$
$$2{,}916$$
$$2{,}826\tfrac{3}{4} \text{ less } 82\tfrac{3}{4} = 2{,}744.$$

So that the proportion runs—

Bulk	.. ..	$2{,}744 + 82\frac{3}{4}$
Interior	.. ..	2,850 + 66

Thus, then, there is rough approximation to the proportion required, as near as can be taken with palms.

Volume over all..	$31 \times 13 \times 14\frac{1}{4}$	$= 5{,}742\frac{3}{4}$	
Content	$27 \times 9 \times 12$	$= 2{,}916$	
Solid bulk	.. .. ..	$= 2{,}826\frac{3}{4}$	
Bottom ..	$31 \times 13 \times 2\frac{1}{4}$	$= 906\frac{3}{4}$	
Sides	$2 \times 31 \times 12 \times 2$	$= 1{,}488$	1,920
	$2 \times 9 \times 12 \times 2$	$= 432$	

This is suggested as the first approach to the shape of the coffer, and if it is put into inches it will be found to closely approximate, but about 2 per cent. too large.

To construct the coffer, dimension in inches, which is to contain 72,277·3, to have a bulk of 70,000, and its bottom bulk to be about one half of its sides, based on $\pi_{ab} = \frac{22}{7}\left(= \left(\frac{44}{25}\right) = \sqrt{\pi_a}\left(\times \frac{25}{14}\right) = \sqrt{\pi_b}\right)$, and the numbers 22, 25, 28.

From the two circles (perimeter and area) of a square on 2×22 we obtain—

	Radius.	Area.	Side.
176	28	2,500	50
	25	1,936	44

Then—

The bulk = cylinder on $28 \times 2{,}500 = 70{,}000$.

Content = 4 pyramids = $\frac{4}{3}\,28 \times 1{,}936 = 27{,}277{\cdot}33$.

The bottom and half sides are to equal 23,333·3̇ nearly.

The measurements of contents to be in the terms of musical or harmonic progression, 6, 4, 3, changed as indicated by Ahmes in Rhind Papyrus according to the formula $a \times b \times \left(c + \frac{c}{2}\right)$ to 9, 4, 3, and further changed to 9, 4, $\pi_{aa}\left(= \frac{44}{25}\,\frac{44}{25} = 3{\cdot}0976\right)$.

Thus—

$$9 \times 4 \times \pi_{aa} \times a^3 = 72{,}277{\cdot}3.$$

But—

$$72{,}277{\cdot}3 = \frac{\pi_{aa}}{3} \,.\, 70{,}000.$$

$$\therefore 9 \times 4 \times 3a^3 = 70{,}000.$$

To find a—

$$a^3 = \frac{17{,}500}{27}.$$

$$a = \tfrac{1}{3}\,\sqrt[3]{17{,}500} = \underline{)25{\cdot}96241}$$

$$a = \qquad\qquad 8{\cdot}654136$$

(used practically as 26).

∴ the dimensions of interior of coffer are :—

Length.	Height.	Breadth.
$9 \times \frac{1}{3}\sqrt[3]{17{,}500}$	$\times \frac{4}{3}\sqrt[3]{17{,}500}$	$\times\ \pi_{aa}\,\frac{1}{3}\sqrt[3]{17{,}500} = 72{,}277{\cdot}33.$

This is equal to $\frac{4}{3}\,\pi_{aa}\,\frac{70{,}000}{4}$, and represents the volume of a sphere of radius $\sqrt[3]{\frac{70{,}000}{4}}$.

For practical purposes—

Length.		Height.		Breadth.		
3×26	$\times$	$\frac{4}{3} \times 26$	$\times$	$\frac{\pi_{aa}}{3} \times \sqrt{26}$	$=$	72,591·176

The thickness of sides will be—

$$\frac{2}{9} \times 25{\cdot}96241 = 8{\cdot}769424.$$

Thickness of bottom—

$$\text{Add } 1{\cdot}105 = 6{\cdot}8753.$$

Therefore bulk over all—

Length.		Height.		Breadth.		
$3\frac{4}{9}\ \sqrt[3]{17{,}500}$	$\times$	$\frac{16}{9}\sqrt[3]{17{,}500} + 1$	$\times$	$\frac{3\pi_{aa} + 4}{9}\sqrt[5]{17{,}500}$	$=$	142,277·33.

For practical purposes—

Length.		Height.		Breadth.		
$3\frac{4}{9} \cdot 26$	$\times$	$\left(\frac{14}{9} \cdot 26\right) + 1$	$\times$	$\frac{3\pi_{aa} + 4}{9} \times 26$	$=$	142,520.
89·5	$\times$	41·444	$\times$	38·4014		

It will be seen, then, that the dimensions for the artificers to work by are rather in excess of those calculated.

—	Outside.			Inside.			Side.	Bottom.
	Length.	Breadth.	Height.	Length.	Breadth.	Height.		
Calculated	89·42607	38·34589	41·4918	77·85723	26·80705	34·61654	5·7694	6·804
For artificers' work.. ..	89·$\dot{5}$	38·401	41·$\dot{4}$	78·000	26·849	34·616	5·$\dot{7}$	6·$\dot{7}$
Petrie	89·620	38·500	41·31	78·08	26·81	34·42	5·89 / 5·67	6·89
Smyth	89·710	38·65	41·17	77·93	26·73	34·34	5·99	6·92

Capacities.

—	Contents.	Solid bulk.	Volume over all.	Bottom.	Two sides.
Calculated	72,277·3	70,000	142,277·3	23,576	46,426
For artificers' work	72,591	69,970	142,520	—	—
Petrie	72,030	70,500	142,530	23,830	46,667
Smyth..	71,317	70,996	142,316	23,758	47,508

Detail of Calculations.

Vol. over all	$89{\cdot}42607 \times 38{\cdot}34589 \times 41{\cdot}4918$		$= 142{,}277{\cdot}3$
Content ..	$77{\cdot}88727 \times 26{\cdot}80705 \times 34{\cdot}61654$		$= 72{,}276{\cdot}8$
Bulk			$= 70{,}000{\cdot}5$
Bottom			$= 23{,}576$
Sides ..	$89{\cdot}42607 \times 11{\cdot}538548 \times 34{\cdot}61654$	$70{,}003{\cdot}5$	$35{\cdot}7149$
	$26{\cdot}80705 \times 11{\cdot}538848 \times 34{\cdot}61654$		$10{\cdot}7076$

If we now test the measurements of Petrie and Smyth by the calculations I have recovered, it will be seen that for the interior Petrie's measurements accord closely with those given to the workmen for length and breadth, but that there is a discrepancy of about ·2 inch for height due, I assume, to insufficient data for a mean of measurements, there being only one point available in the broken coffer (*see* "Our Inheritance in the Great Pyramid") giving a difference of 500 cubic inches, or about $\frac{1}{140}$, the solid bulk being about 500 too much and the content 500 too little, the volume over all agreeing almost exactly:—142,520 and 142,530. Of course the discrepancy may be due to the workmen having failed to work exactly according to the measurements given them, and thus having made the coffer not quite deep enough.

XI.—Comparison of the Measures of Babylon and Egypt.

The two sets of measures are distinct, but I do not think there is sufficient data yet to ascribe one set particularly to Babylon and the other to Egypt.

They both seem to start from a standard measure of 14 palms cube = 70,000 cubic inches.

In the case of the measures of Babylon, Phœnicia, and the Hebrews, they have avoided the binary system, that is to say, they avoid the cube of 7 palms, $3\frac{1}{2}$ palms, &c., which they might have taken, and, as will be seen (in Chapter XII), they have found out other divisions, but they keep to cubes and cubes only.

In the Egyptian system, on the other hand, they have adhered to the binary system, using apparently cubes, cylinders, pyramids, cones, &c., a portion of which, the system of cylinders, is our British system of measures at the present day.

There are, however, other Egyptian measures still to be investigated.

XII.—The Hebrew Measures of Capacity.

There are two passages in the Old Testament which may indicate the standard of the measures of capacity used by the Hebrews, viz., the account given of the size of the Brazen Sea, and the 10 lavers at the building of the temple of Jerusalem.

Unfortunately it will be seen at a glance that there is a discrepancy in the measures used, so that there must either have been a different cubit used or a different measure employed, and, further, the Brazen Sea is described,[1] Kings vii, 26, as containing 2,000 baths, and 2 Chron. iv, 5, 3,000 baths.

The LXX do not give the content of the Brazen Sea, and Josephus ("Ant.," viii, iii, 5) concurs with 2 Chron. iv, 5. Colonel Watson, in his paper ("Jewish Measures of Capacity," Palestine Exploration Fund *Quarterly*, 1898, p. 104), suggests that as a cylinder is to a hemisphere as 3 : 2, it is probable that the Sea was a hemisphere as stated by Josephus, and that the calculation in 2 Chron. iv, 5, and Josephus was for a cylinder. This, if it may be accepted, clears off one difficulty. The next, however, is more difficult to deal with. Taking the Sea and the laver both as hemispheres, we have two vessels, one 2 cubits the other 5 cubits in radius, so that their relative capacities should be as $(2)^3 : 5^3 :: 8 : 125 :: 1 : 15{\cdot}6$; whereas their ratio as given in the Old Testament is as 40 : 2,000 :: 1 : 50. This discrepancy has been frequently pointed out by writers, and Colonel Watson proposes to rectify it by reading seah for bath (1 Kings vii, 26), and as there were 3 seahs to a bath, the ratio of the laver to the Sea would be 1 : 16·6, which is pretty close to 1 : 15·6, and seems near enough, as the account both in Kings and Chronicles evidently speaks in round numbers, as 30 cubits is given as the circumference of a circle of 10 cubits diameter instead of $10 \times \frac{22}{7} = 31{\cdot}4 +$.

That the LXX supposed different measures to have been used may be inferred from their using different names. The Old Testament, however, used only the word bath, and I propose therefore to leave the dimensions of the Brazen Sea as insoluble at present, and to consider only the size of the 10 lavers.

I assume from the account in the Bible, and the description given by Josephus, that these vessels were hemispherical, and not conical, cylindrical, or cubical.

I also assume that the Hebrews used the same two cubits of 6 and 7 palms as did the Egyptians, but that in this instance they employed the smaller cubit of 6 palms $= \sqrt{\frac{22}{7}} \times 10$ according to the statement in the Talmud (Menachoth 97, *a*, *b*, Midd., iii, 1), that the smaller cubit was used for a portion of the altar, for the altar of incense, &c. The diameter given 1 Kings vii, 26, is 4 cubits. This, regarding the laver as a hemisphere, gives the following content :—

$$\frac{2}{3}\pi r^3 = \frac{2}{3} \cdot 8 \left(\sqrt{\frac{22}{7}} \right)^5 \times (10)^3$$

$$= \frac{16}{3} \cdot 17{,}511{\cdot}03$$

$$= 93{,}333 \text{ pyramid units.}^1$$

Dividing this by 40 gives the content of a bath as 2,333·3 units, and as 30 of these = 70,000 we have 30 baths equal to the Pyramid coffer.

This coincidence, among so many, leads me to suppose that the Pyramid coffer of 70,000 units or 2,744 cubic palms must not be treated only as Egyptian, inasmuch as its correct content is recorded in the Great Pyramid, but that it originally belonged to all the ancient nations, and was the standard common to all.

The measures going down from the coffer, quarter, bushel, gallon, to a pint are binary, but the measures used by the Babylonians, Phœnicians, and Hebrews progressed in a singular manner.

Binary— Cubic inches.

$$\frac{70{,}000}{4 \times 8 \times 8 \times 8} = \frac{70{,}000}{2{,}048} = 34{\cdot}2 \text{ pyramid pints.}$$

$$\frac{70{,}000}{4 \times 3 \times 2 \times 3 \times 10 \times 3} = \frac{70{,}000}{2{,}160} = 32{\cdot}4 \text{ logs.}$$

At first sight this latter arrangement seems of a very arbitrary character, but the fact is it is governed by the theory of numbers, and the necessity for adhering to whole numbers or simple or moderate fractions, and by the measure used being a *cube*.

They started with the coffer of 14 palms cube = 2,744 palms cube. The next cube they can arrive at is $9\frac{7}{10} = 912{\cdot}67$ palms cube. This is one-third of a coffer, and the discrepancy is 2,744 : 2,738. It was called a kor. The next cube is $6\frac{1}{2}$ cubic

[1] For simplicity 17,500 has been used instead of 17,511·03.

palms, which gives 3 baths, the discrepancy being 2,744 : 2,746. The next cube is $4\frac{1}{2}$ cubic palms, which gives 91·125 cubic palms, and a discrepancy of 2,744 to 2,734. This was called a bath. The next cubes in succession are :—

			Cubic Palms.	
$3\frac{1}{8}$ cubic palms	..	1 seah ..	30·507	2,746·5
$2\frac{12}{25}$,,	..	1 hin ..	15·254	2,745·8
$2\frac{1}{10}$,,	..	1 omer ..	9·261	2,778
$1\frac{18}{25}$,,	..	1 cab ..	5·088	2,747·4
$1\frac{1}{12}$,,	..	1 log ..	1·268	2,739·8

It will be seen that all these cubes are within an error of $\frac{1}{500}$, which is inappreciable in such measures.

This system differed in several ways from the binary system. The measures were all cubes, the pyramid unit was not used, and no one measure in the binary system approaches nearly to one in the Hebrew system, *i.e.*, the baths, seahs, hins, omers, cabs, and logs can have nothing whatever to do with quarters, bushels, gallons, and pints, except that both systems are subdivisions of the coffer or chest of 70,000 units, or $(14)^3$ palms.

I append Tables IV and V for comparison of cubic content of these Hebrew measures with those of the Egyptians.

Josephus gives the bath as the equivalent to 2,300 cubic inches, giving a discrepancy of about $\frac{3}{200}$.

Here are the various estimates of the cubic content of the bath given in "Encyc. Brit." :—

	2,500
	2,240
	2,260
	2,300
	2,200
	2,250
	2,380
Average ..	2,304

The Rabbins also said that a cubic cubit of 21·5 inches gave a content of 320 logs; this is again a close approximation.

It seems to me that there can be no doubt then that the early Hebrew, Babylonian, and Phœnician measures of capacity are subdivisions of the cube of 14 palms.

The one cube that does not seem to have been used is that of 7 palms $\left(\frac{1}{8} \text{ of a chest}\right)$, probably because it could not be combined with multiples of 3.

XIII.—Hebrew Square Measure.

The cubes forming the measures of capacity are 14, $6\frac{1}{2}$, $4\frac{1}{2}$, $3\frac{1}{8}$, $2\frac{1}{2}\frac{2}{5}$, $2\frac{1}{1}\frac{1}{0}$, $1\frac{1}{2}\frac{8}{5}$, $1\frac{1}{1}\frac{1}{2}$ palms a side. There is only one of these which can directly be adapted to square measure, viz., $3\frac{1}{8}$ cubic palms, the value of the seah, and therefore the ancients have taken it as the standard. It is $\frac{25}{8}$ cubic palms.

The theory of the square measure, as derived from cubic measure, is that given a certain number of grains and placing them a certain distance apart, the cubic measure should hold sufficient corn grains to cover the square measure. In other words, a seah of land is the area that can be sown with a seah of corn.

We know from records of the past ("Encyc. Brit.," W. and M.) that the seah of square measure was 50 cubits square.

The object now is to ascertain how one was derived from the other.

We must first have some notion as to the number of grains of barley contained in a log, cab, seah, &c. Of course the number will be a purely conventional one, as no doubt the grains of barley were taken as a standard after the measures of capacity were instituted. We know that a log of water is of 32·4 + cubic inches capacity, and weighs 8,187·4 Imperial grains.[1]

Then the question is, what may a log hold (= weigh) in barleycorns?

In Piazzi Smyth's list of specific gravities ("Our Inheritance in Great Pyramid") he gives barley (*loose* as in bushel) : distilled water : : 112 : 175. "Whitaker's Almanack" gives a bushel of water 80 lbs. to the following:—Mediterranean barley, 50 lbs.; French barley, $52\frac{1}{2}$ lbs.; English barley, 56 lbs., giving a proportion—

$$\begin{aligned} 50 &: 80 \\ 52\tfrac{1}{2} &: 80 \\ 56 &: 80 \end{aligned}$$

But this again appears to be for loose barley. The measure of

[1] I have taken 252·7 Imperial grains to a cubic inch of *rain* water, 252·286 Imperial grains being the weight of a cubic inch of distilled water under Order in Council, November 28th, 1869.

barley of ancient times was full measure, running over, pressed down, so that there was a considerable percentage more than merely loose barley.

Heaped measure was abolished in this country in 1878 (Chaney, "W. and M.," p. 128), but yet the grain is not now supposed to be put in *loosely* but shaken down from a height of 2 to 3 feet and *pressed* and struck, giving an addition of about 13 per cent. to the loose measure already indicated. By adding on this 13 per cent. we get the following averages:—

	Barley.	
Piazzi Smyth..	$126\frac{1}{2}$	
Mediterranean barley	$123\frac{1}{2}$	water
French barley	$130\frac{5}{10}$	175
English barley	137	

We will take the Mediterranean barley and applying this to the log we get the number of barley grains as $\frac{8{,}187{\cdot}4 \times 123{\cdot}3}{175} = 5{,}760$.

That is to say, a log contains about 5,760 Imperial grains as compared with water. This is merely a tentative inquiry to ascertain approximately the number of barley grains to a log. It is not to be supposed that Imperial grains are equal to barley grains; judging by what takes place usually there should be a considerable amount of degradation in the Imperial grain, and we may probably assume that the number of barleycorns in a log was nearer to 5,000 than to 5,760.

Assuming, then, that the number is somewhere about 5,000, 200 or 300 more or less, we can now ascertain conventionally the area of land that a seah will sow.

The distance apart of each grain must be tried. We will therefore take the following distances for trial:—2, 3, 4, 5 digits.

There are 2,500 square cubits in a square seah. This would give the following number of grains at the numbers 2, 3, 4, 5 digits apart, viz.:—

Cubit of 6 spans	None suitable.
Cubit of 7 spans	61,250·0
	91,875·0
	122,500·0
	153,025·0

Out of these the only one suitable is the distance of 4 digits or 1 palm, giving 122,500 grains. There are 24 logs to a seah—

this gives 5,104·166 barley grains to a log. An inspection of these numbers will show that the cubit is one of 7 palms.

The only symmetrical method of arranging 122,500 conventional barleycorns in a seah so as to preserve whole numbers is for the base to number 50 × 50 grains, and the height 49 grains. By this artifice cubic measure may be turned into square measure.

The base of the seah measures $\frac{25}{8}$ palms square. There will be 49 of these layers, and if all are laid in one layer the square surface will be $\frac{25}{8} \times 7$ palms a side.

Multiply by 16 each way and we get a square area of 50 × 7 palms a side, or 50 cubits square of 7 palms each, giving a distance from centre to centre of barleycorns of 1 palm.

This seems to be a very small number of grains for sowing an area of ground, about half what is used in England at the present day, but I think there can be little doubt it was the conventional number which connected square with cubic measure.

Note each conventional grain is a *cube* occupying the space of $\frac{1}{16}$ square palm a side.

It is suggested that the 500 cubits square given by the Talmudists as the area of Temple enclosure was derived from the area circle of the Pyramid base, and was 500 cubits of 20·6109 inches.

XIV.—Weights—Babylonian and Hebrew.

We shall now be able to apply a test to the number of grains found to a log by examination of the Babylonian weights, viz.: Given 5,104·16 barley grains to a log—what is the weight of the log of water in terms of these grains, $\frac{5{,}104{\cdot}16 \times 175}{12 \times 3{\cdot}3} = 7{,}244$ grains.

The number of grains weight in a log = mina is likely to be 7,200, to keep up the symmetry of the system of 3 × 2, as will be seen hereafter. This is the number Madden arrived at in the Babylonian system of weights ("Madden's Jewish Coins," pp. 267, 289). We may therefore take the relative weights of water and pressed barley in a log to be 7,200 : 5,104·16.

100 : 70·9.
176 : 100.

TABLE I.—*Connection between Palms and Pyramid Units (=British Inches).*

Digits.	Palms.	Palms cubed.	Cubic inches.	Compared with cubits of 7 palms (440).			Cubit in British inches or Pyramid units.	Remarks.
				Number of cubits.	Multiples.	Test of Error.		
$4\frac{1}{3}$	$1\frac{1}{12}$	$(1\frac{1}{12})^3$ Log	32·4	—	—	—	—	—
8	2	—	—	1536	—	3072	—	—
8·4	$2\frac{1}{10}$	$(2\frac{1}{10})^3$ Omer.	—	—	—	—	—	—
9·92	$2\frac{12}{25}$	$(2\frac{12}{25})^3$ Hin.	—	—	—	—	—	—
12	3	—	—	1024	—	3072	8·83322	—
$12\frac{1}{2}$	$3\frac{1}{8}$	$(3\frac{1}{8})^3$ Seah.	—	—	—	—	—	—
14	$3\frac{1}{2}$	—	—	—	—	—	10·305454	—
16	4	—	—	768	—	3072	11·77763	—
18	$4\frac{1}{2}$	$(4\frac{1}{2})^3$ Bath	—	684	$4\times3\times57$	3078	—	—
20	5	—	—	616	$8\times7\times11$	3080	14·72204	—
22	$5\frac{1}{2}$	—	—	560	$8\times7\times10$	3080	16·19426	—
24	6	—	—	512	$8\times8\times8$	3072	17·66646	$10\sqrt{\frac{22}{7}} = 17{\cdot}728$.
26	$6\frac{1}{2}$	$(6\frac{1}{2})^3$ 3 Baths	—	474	$2\times3\times79$	3075	19·13866	—
28	7	$(7)^3$	87·50	440	$4\times11\times10$	3080	20·610909	Building cubit.
30	$7\frac{1}{2}$	—	—	410	41×10	3075	22·08403	22
32	8	—	—	384	—	3072	23·55545	—
34	$8\frac{1}{2}$	—	—	362	—	3077	25·02748	25
36	9	—	—	342	$2\times3\times57$	3078	26·49968	—
38	$9\frac{1}{2}$	—	—	324	$3\times9\times12$	3078	27·97189	28
38·8	$9\frac{7}{10}$	$(9\frac{7}{10})^3$ Kor.	—	—	—	—	—	—
48	12	—	—	—	—	—	—	—
52	13	—	—	—	—	—	—	—
56	14	$(14)^3$ 30 Baths = 1 chest	70·000	222	—	3080	41·221818	—

The cubit of 7 palms (20·610909 inches) is derived from the base of Great Pyramid, 6,093·8 inches ÷ 440.
$(4\frac{2}{3})^3$ palms = 80 logs.

TABLE II.—*Various Values Used.*

$\frac{22}{7}$	3·142358	$\sqrt{\frac{22}{7}}$	1·772810	$\left(\sqrt{\frac{22}{7}}\right)^5$	17·51103	$4\left(\sqrt{\frac{22}{7}}\right)^5$	70·04412
$\left(\frac{44}{25}\right)^2$	3·0976	$\frac{44}{25}$	1·7600				
$\left(\frac{25}{14}\right)^2$	3·188775	$\frac{25}{14}$	1·785714				
π	3·1415926+	$\sqrt{\pi}$	1·772454+	$(\sqrt{\pi})^5$	17·4934	$4(\sqrt{\pi})^5$	69·9736
$(17·5)^{\frac{2}{3}}$	3·142065	$\sqrt[5]{17·5}$	1·772585	—	17·5	—	70·000
$\frac{223}{71}$	3·140846	$\sqrt{\frac{223}{71}}$	1·772242	$\left(\frac{223}{71}\right)^{\frac{5}{2}}$	17·482	$4\left(\frac{223}{71}\right)^{\frac{5}{2}}$	69·9318
$\frac{19}{6}$	3·$\dot{3}$						
$\frac{60}{19}$	3·1578+						
$\frac{19}{6} \times \frac{60}{19}$	10·000						

9,068·8 inches (base of Pyramid) divided by 440 gives a cubit of 20·610909 inches.

$\frac{6}{7}$. 20·610909 inches (cubit of 7 palms). 17·66640 inches, common cubit of 6 palms.
2·9444 ,, 1 palm.
0·7361 ,, 1 digit.

$\sqrt[3]{70,000} = 41·21284 - 20·60642$ British inches.

$\sqrt[3]{4\left(\frac{22}{7}\right)^{\frac{5}{2}} \times (10)^3} = 41·2215$ 20·61075 ,, ,,

$\sqrt[3]{70,041·6} = 41·2210$ 20·6105 ,, ,,

$\sqrt[3]{70,045·6} = 41·2218$ 20·6109, cubit of 7 palms.

TABLE III.—*Values of Original Measures.*

—	—	Cubic Palms.		
		Quarter.	Chest.	Corrected to π.
Cube, 14 palms a side	343×8	—	2,744	2,744
Cylinder, $9\frac{1}{2}$ palms radius and height ..	$(9\frac{1}{2})^3 \times \frac{34}{19} \cdot \frac{34}{19}$	—	$2,745\frac{1}{2}$	$2,693\frac{1}{4}$
Box, $17 \times 17 \times 9\frac{1}{2}$	—	—	$2,745\frac{1}{2}$	$2,745\frac{1}{2}$
Cylinder, 6 radius and height	$6^3 \times \frac{19}{6}$	684	2,736	2,713
Pyramid, $\frac{(15)^2 \times 9\frac{1}{2}}{3}$..	—	$712\frac{1}{2}$		
Pyramid, less $\frac{(5)^2 \times 3 \cdot 2}{3} = 27$	-27	685	2,740	2,740
Cone, $8\frac{1}{2}$ base radius and height $9\frac{1}{2}$ ..	$(8\frac{1}{2})^2 \times \left(\frac{30}{17}\right)^2 \times 9\frac{1}{2}$	$712\frac{1}{2}$		
Cone, less $2\frac{3}{4}$ base, $5\frac{1}{2}$ height = 26.. ..	26	$686\frac{1}{2}$	2,746	
Two cubes of 7 palms a side..	—	686	2,744	2,744

TABLE VI.—*Showing the Various Measures Represented by the Pyramid Coffer.*

	Dimensions in Linear and Cubic Inches.	Cubic Inches by Egyptian Value of π. Quarter.	Chest.
Bulk ..	Bulk of stone coffer, bottom 23,576, sides 46,426 C.I.	—	70,002
	Cylinder $(28)^3 \times \pi_{bb} \left(= \frac{25}{14} \cdot \frac{25}{14}\right)$ (true content by $\pi = 68,962$ C.I.)	—	70,000
	Box, $50 \times 50 \times 28$	—	70,000
	4 cylinders $= 4\left(\frac{22}{7}\right)^{\frac{5}{2}} \times (10)^3$	17,511·04	70,044·16
	Cube of 41·2215, the double cubit of 14 palms	—	70,044·16
	8 cubes of 20·61075, the cubit of 7 palms		
	4 cubes on 26 ($\sqrt[3]{17,500} = 25{\cdot}95$)	17,576·0	—
Content	4 Pyramids $= \frac{(44)^2 \times 28}{3}$	18,069·33	72,277·33
	4 cones $(25)^2 \times 28 \times \pi_{aa} \left(= \frac{44}{25} \times \frac{44}{25}\right)$		
	Sphere $\frac{4}{3} \pi_{aa} \frac{70,000}{4}$, *i.e.*, a sphere of radius $\sqrt[3]{17,500}$ = nearly 26 ..	—	72,277·33
	Coffer of harmonic progression :— $77{\cdot}88727 \times 26{\cdot}80705 \times 34{\cdot}61654$ .. .. $\left(3 \times \frac{4}{3} \times \pi_{aa} \frac{1}{3}\right) \sqrt[3]{17,500}$	—	72,277·33

TABLE VII.—*Showing that the English Square Measure is based on a Cubit of* 19·8 *Inches, which may possibly be the* 20·6109 *Inches Cubit depreciated by the lapse of Time.*

	Square Yards.	Cubit of 19·8 Inches.	
		Linear.	Square.
1 pole ($5\frac{1}{2}$ yards)^2	$30\frac{1}{4}$	$(10)^2$	100
1 square chain (22 yards)^2	484	$(40)^2$	1,600
1 square rood 40 × ($5\frac{1}{2}$ yards)^2	1,210	40 × $(10)^2$	4,000
1 acre or 4 roods 10 × (22 yards)^2	4,840	10 × $(40)^2$	16,000
10 acres 1 stadium (220 yards)^2	48,400	$(400)^2$	160,000
640 acres (8 × 10 × 22 yards)^2	1 square mile	$(3,200)^2$	10,240,000

(*To be continued.*)

PALMYRENE INSCRIPTIONS.

By Lieut.-Colonel C. R. Conder, R.E.

The publication, by Professor D. H. Muller of Vienna, of 40 new Palmyrene texts, has raised some discussion as to details of translation. Like the previously known examples, they present a strange admixture of Greek and Latin loan words, which causes some of these inscriptions to contain more foreign than native terms. The Palmyrenes adopted Roman names, and Greek titles of official dignity, and Greek architectural terms, showing—like the language of the Mishna or the Greek texts of Bashan—how strong was the civilising influence of the empire in the first, second, and third centuries A.D.

In one case the words following the date of the text have been much discussed, but the real meaning seems to me to have been missed. This text reads as follows :—

עתיכא	𐡏𐡕𐡉𐡊𐡀
בר מלכו	𐡁𐡓 𐡌𐡋𐡊𐡅
חבל שנת	𐡇𐡁𐡋 𐡔𐡍𐡕
513 ספרא	513 𐡎𐡐𐡓𐡀
רומני	𐡓𐡅𐡌𐡍𐡉

"Eutyches, son of Malchus. Alas ! Year 513, Roman reckoning."

The Palmyrenes, and the Romans in Syria, used the Seleucid era, and the date is 202 A.D. This era was not, strictly speaking, Roman, but was used by Romans. Even to the present day the word *Rûmi* in Syria means "Greek"—the Eastern Roman Empire.

NOTES ON THE "QUARTERLY STATEMENT."

By Lieut.-Colonel C. R. Conder, R.E.

Tell Zakarîya.—The general plan of the fort at this place (p. 91) is similar to that of the Byzantine fortresses, especially those built by Justinian, and the masonry is similar to that found throughout Palestine belonging to buildings of the Byzantine period. The place, however, was clearly an ancient town, and lay within the area conquered by Thothmes III, whose name is found on a scarab at the site. The little idols may be of late date, as compared with those found in Phœnicia, at Gaza, and elsewhere. The most interesting find is the inscription on a jar-handle belonging to the "King of Hebron." David is the only known Hebrew King of Hebron, but the forms of the letters show that the text cannot

be older than about 700 B.C. Possibly at this time a small local king may have established himself, as Sennacherib speaks of the Philistine kings west of Judah in that age; but the text might be yet later, and belong to the period of the captivity. The inscription on the weight seems to me to read סלע, or "standard," and the second letter has the same form found in the Siloam text, and is as yet peculiar to Southern Palestine.

The Tomb near Calvary (p. 130).—It does not appear to me that the crosses found in this tomb are ancient. The double, or "Patriarch's," cross is known in the end of the ninth century, on coins of the Emperor Leo VI, and was commonly used in the eleventh and twelfth centuries, but as far as I know it is not found in any early work. Both the crosses in question are Patriarch's crosses. The Greek letters, A and Ω, accompanying these crosses do not of necessity indicate Greek origin, or early date. They occur in the frescoes of the mediæval monasteries, near Jericho, and elsewhere.

THE STANDING STILL OF THE SUN UPON GIBEON.

By the Rev. W. Collins Badger, M.A.

I highly esteem Colonel Conder for his work and interest in Scriptural interpretation. While not agreeing with his remarks in your *Quarterly Statement*, 1899, p. 161, I feel sure that he will welcome an exhaustive examination of Joshua x, referring to the miracle. A little 1*s.* book, published by Messrs. J. Nisbet for me 10 years ago, contains all that can be said about it. Now I make my remarks as brief as possible, only premising that the Bible, if possible, should be its own interpreter. Acting on this presumption I give the meanings of the word translated "Stand still," or, as the Colonel, "Be dark." This word, then, Dōm, Taylor's "Heb. Concordance" renders "to be silent, quiet, wait"; so Hab. ii, 19, silent or "dumb idol"; 16 times in our Bible it is translated "silence," as Psalm xxx, 12; five times, at least, "Be still," Psalm iv, 4; Levit. x, 3, "Aaron held his peace"; Psalm cxxxi, 2, "Quiet oneself"; 1 Saul xiv, 9, "Tarry"; Psalm lxii, 5, "Wait"; Psalm xxxvii, 7, "Rest."

But never "Stand still," except in Joshua x, and never an allusion to darkness. To put the matter beyond doubt let any one substitute "Stand still" in these texts; why it would be "the stand still idol." Aaron stood still, "kept his *feet* still, not his tongue"; "Rest in the Lord," would be "Stand still in the Lord," or, "Be dark" in the Lord. "Praise waiteth for Thee," would be "Praise standeth still," or "is dark." Jer. xlvii, 6: "Sword of the Lord—be still," would be "Stand still." I leave it to others to follow out these impossible renderings, only observing that "Stand still" or "Be dark" are utterly *unwarranted and misleading*. Another important word is "midst," which ought to be

translated "half." So Taylor gives "to divide in two." One instance will suffice to show the folly of "midst." 1 Kings iii, 25, Solomon says, "Divide the living child in two, and give half to the one and half to the other," but translate "midst," and "give *one midst* to the one and *one midst* to the other," would be utter nonsense; equally so is it for the Sun to stand still in the *midst of the* heavens. To put the meaning beyond doubt, 110 times it is translated "half," and only four or five "midst," which should be altered to "half." It is absolutely certain, then, that "half" is the proper translation of *Chetsi*. The right translation then is, "Sun rest, wait, or tarry in the half of the heavens," and the half can only mean the visible horizon.

Then "*hasted* not to go down," or set (Gen. xv, 17), implies motion but not rapid, as the Eastern sun dips suddenly out of sight. Further, "*as*," Patrick and Lowth on this word say, Caph does not imply similitude, but the very thing itself; it means then the definite time of a whole day. *Whole* also stands for a full and perfect number of anything. But if the earth were standing *still*, which is the clock of the world, how measure a whole day? Can God's word be so irrational? All these five words then, "tarry," "half," "hasten," "as," "whole," exclude "standing still" or "darkness," and linked together they form a chain which cannot be broken. The translation then should be, "Then Joshua is speaking to Jehovah, and says, before the eyes of Israel, Sun over Gibeon tarry and Moon in the Valley of Ajalon, and the Sun is tarrying and the Moon stays till the nation is avenged of their enemies. Is not this written in the Book of the Upright, and the Sun is tarrying in the half of the heavens, and does not hasten to set for a complete day, and there has not been as this day before it or after it." A Dean of our Church calls this miracle "worse than the wildest notions of Hindoo or Mahomedan fables"; Colenso, "the greatest instance of Scripture and Science being at variance." Did they ever study the Hebrew? I have tried to get an answer in vain. I have appealed to a Jewish Rabbi in vain. I challenge contradiction to what I have written. Colenso and the Dean say that the Bible statement affirms "the clash and ruin of the Universe if the Sun stood still—or appeared to." Surely they ought to have proved it from the Hebrew, and not rashly condemn the Bible from a false translation.

But all who believe the inspiration of the Bible will see that instead of the Earth stopping in her motion the Hebrew affirms the contrary; and that all necessary was the continuance of daylight for two days by the rays of light somehow keeping the Sun visible. I must not trespass on you, and can only add, it was a crisis in the history of the world, and certainly the miracle of continuing the daylight was worthy of the occasion — for Israel annihilated — where the promises? The Jewish dispensation? the Christian? and the world's regeneration? Besides the miracle dispersed the Canaanites and prevented innumerable battles, and so, in wisdom and goodness, was that day prolonged.

BRESSINGHAM, *April 15th*, 1899.

NOTE ON THE SITE OF THE TEMPLE.

By Vicomte François de Salignac Fénelon.

Can you kindly find room in the columns of the *Quarterly Statement* of your Society, to which I have subscribed with genuine interest, for a few remarks relating to the site of the Temple, which formed the subject of a learned article by Lieut.-Colonel Watson in the number for January, 1896?

1. The cubit of the dimensions of the Temple is generally allowed to be equivalent to 0 mètre 525 millimètres; the common or Greek cubit was less by a tenth.

2. The platform of Solomon must have extended some 200 or 300 cubits beyond the enclosure of the Haram, in the direction of the Cedron.

3. The Mischna recognises the existence of crytoporticoes or covered passages built upon the mountain, lower than the porticoes of the Temple. Josephus assigns 200 cubits to the mole of these substructions on the east side, that is to say, that the ground of the Court of the Gentiles, like that of the Antonia, which communicated with the Court, rose some 30 or 40 metres above the actual ground. On the south the relative elevation was not so great, and the wall of Ophel rejoined the walls of the Palace and of the Temple at the south-east angle. On the north there were two natural ravines and hollowed-out trenches. Finally, on the west, Millo's works of art, consisting partly of an embankment and aqueduct, and partly of a bridge, connected the Temple with the Upper City, and, by means of steps, with the Lower City or the City of David.

4. The description of the plans of the Temple, recorded in the historical and prophetical books of the Scriptures, has formed the subject of lengthy researches by the commentators. Following in their footsteps, the writer of these lines has endeavoured in a descriptive and methodical series of architectural drawings, not yet published, to trace the porticoes and Solomon's courts. The essential feature of these plans is to be found in the triple and square enclosure of the portico of the Gentiles, of the floor of the porticoes of Israel, divided into courts and connected with the porticoes of the Priests by their connecting porticoes, with the Sanctuary opposite the central court where the altar rose. The Palace was situated on the south, separated from the Temple, but on the same esplanade. In the time of Herod this site was still an appendage of the Temple. Such are the general remarks in reference to this keenly-debated question which I wish to put before the readers of the *Quarterly Statement*. If you consider them of sufficient importance I shall be greatly obliged if you will insert them in the pages of your journal. Allow me at the same time to repeat my sympathy with the objects of your Society.

Toulouse, *April 8th*, 1899.

NOTE ON THE TWELVE STONES FROM THE JORDAN.

By the Rev. W. H. B. Proby.

May I suggest that in Joshua iv, 9, before the clause "in the midst of Jordan," we should understand "which had been"? Such ellipses are not without example in the Old Testament: one just like this occurs in verse 11, "[who had been] before the people," *i.e.*, at starting. Joshua does not seem to have been as careful a writer as Moses (p. 161).

The above explanation enables us to avoid the conclusion which Colonel Conder seems to have accepted ("Tent Work in Palestine," vol. i, p. 22), that the twelve stones were carried all the way from Jordan to Mount Ebal.

SCHEME FOR FINDING THE SEPULCHRES OF DAVID.

By Rev. W. F. Birch, M.A.

It would be very easy for the German Emperor to discover within 40 days the tomb of David. Any garden on southern Ophel (so-called) would be open to him, and £1,000 would, I believe, amply cover an exhaustive exploration.

Three points need to be considered beforehand, viz., (1) *where* to search; (2) *what* to search for; and (3) *how* to search.

The (1) question has often been dealt with in these pages. With the Bible as my guide, I cheerfully maintain, against all comers, that the southern end of Ophel is the only possible site for the sepulchres of David named in Neh. iii, 16 (*Quarterly Statement*, 1898, p. 161). As a weighty consensus of opinion places them in this general position, it is needless for me here to say more. It only remains for some happy explorer to demonstrate the correctness of this opinion by actually discovering them.

The (2) question is, "What was the character of the sepulchres?" No doubt a rock-hewn passage led from the rock-surface into one or more rock-hewn chambers. This seems to have been the opinion of Josephus ("Ant.," vii, xv, 3; xvi, vii, 1), and Professor Clermont-Ganneau (*Statement*, 1898, p. 167) speaks of "the vast chambers of the vault, which possesses probably several stories." Both in the tomb of the Judges and also in the large tomb in the Kedron Valley (*Statement*, 1892, pp. 31, 35) there is a chamber practically 20 feet square. The modest claim may, therefore, be safely conceded, that the sepulchres of David included at least one chamber of about this length and breadth,

and (*vide* illustrations, pp. 31, 35) practically rectangular. This claim is so excessively moderate that I forbear further evidence. The surface entrance may have been vertical, some 2 feet square (*Statement*, 1884, p. 78) ; or horizontal (1898, p. 167), with a possible area of 20 feet. This entrance may now be 10 feet below the surface, and also have been so contrived as not to attract notice. As the recent excavations at Jerusalem cost £1,000 a year, it is evident that to systematically lay bare southern Ophel down to the rock, or to exhaustively grope underground by shafts and galleries for an aperture of the size of 4 or even 20 square feet, would be a gigantic task and prohibitively expensive.

The (3) question is, How to go to work in some better and more practicable way. On reflection, I have come to see that it is practically hopeless to attack the tomb by the front entrance. It may, however, be easily taken in the rear. Instead of drawing a bow at a venture at an unseen object of the size of but 4 or 20 square feet, let us take as our mark the said chamber with an area of 400 square feet, and then, even if we shut our eyes, we cannot long miss hitting it.

By boring vertically let us prospect on Ophel, not for coal but for ashes ; not for gold coin, but for royal dust, or for the said chamber. Professor Boyd Dawkins informs me that the Jerusalem rock would not be difficult to deal with, and that "to a depth of 50 feet the boring (diameter at least 3 inches) would be most cheaply made by hand with a jumper ; the cost of such work near Manchester would be ten shillings per foot at the outside." As labour is much cheaper at Jerusalem, 50 feet ought, I think, to be bored for £10. I may add that the Ophel rock seems specially favourable to our project, embracing, according to Sir J. W. Dawson, "softer white limestones, including the bed of *Malake*."

Suppose some fine day our "jumper" at 50 feet goes with a run into a cavity. Whether this be artificial or in a natural state is the next thing to be ascertained. The scraping or dredging of the floor might reveal particles of broken lamps or crumbled bones, even without the aid of a microscope. Further, I would suggest lowering through the bore a long, hollow rod with a hinged lower limb (a yard long), like a plain capital L, so contrived that the lower limb could, at will from the surface, be both opened and closed like the blade of a penknife, and also telescoped or extended, so as to reach 12 or 20 feet. Provided with such a simple mechanical contrivance, a wire-puller at the surface would apparently, by probing, have no difficulty in measuring in every direction within the said distance. A mark on the rod at the surface would show the direction in which the lower limb pointed, while the cord by which the elastic or telescopic limb was contracted or extended would indicate the distance in various directions from the rod to the extremity of the probe. The measurements thus obtained from one centre would be enough to enable even a tailor, not to mention Dr. Schick, to reproduce on paper a correct plan of any cavity discovered. If the sides and roof worked out to be practically straight, the cavity would obviously be

artificial, and if at a depth of at least 20 feet below the rock surface, sepulchral. Further, this patent probe, delicately handled, would also suffice to detect *kokim* (tunnels for bodies), and even the entrance to the chamber. With fresh bores repeated, as required, the passage from the chamber could gradually be traced to the original rock surface. A shaft is now sunk through the soil, and the successful explorer penetrates in awe to the silent and long-hidden catacombs of the City of David.

If on a plan the part of Ophel covering David's tomb was marked out like a chess-board into squares of 20 feet aside, then it is clear that by boring downwards in the middle of one square after another, the 20 foot chamber of David's tomb must inevitably sooner or later be penetrated and the perplexing puzzle of the royal sepulchres solved.

As the surface of Ophel slopes, to reach the same final level, the bores would be of unequal length; and as every square would not really be equally likely to cover the chamber, the judgment of the master-borer would always be exercised in selecting the likeliest squares.

With studied moderation I have supposed the existence of *but one* chamber, *only twenty* feet square, but in reality Ophel is, I believe, simply honeycombed with[1] vaults more than 20 feet square. Passages and recesses have also to be thrown in.

Suppose that the area of 100 known squares included the site of David's tomb, the chances would be equal that 50 bores (costing, as estimated, £500) would reach it. But as one may well allow for more and larger chambers, as well as for recesses and passages, I should not expect that even 10 bores would be driven to a depth of 50 feet before the "jumper" plunged into an artificial excavation connected with a tomb.

As yet, I believe, not even one ancient tomb has been found on southern Ophel, so that the discovery therein of a sepulchral cavity would be a remarkable find. Of course the earliest found chamber might probably have no direct connection with David's tomb, since several kings (Jehoram, Joash, Uzziah, Ahaz) were buried in (*i.e.*, *within*, or at least *near*) the city of David, but not among the good kings.

When the first-found tomb with its passages has been laid down on a plan and the ball of discovery thus set rolling on Ophel, the result of the next bore will be watched with the keenest interest. Possibly some friend of the Fund, enthusiastic about Jerusalem discovery, would claim the next square by paying £10. I think here in Manchester we could take up several squares, as Queen's Bishop's 3rd. Salford might appropriate the Knights' squares.

Possibly some peculiarity in the arrangement of the first-found chamber might suggest a strong presumption that it was distorted owing to the proximity of another tomb; and so a side bore from the first tomb might be better than a second vertical one. Further speculations I must omit, and in conclusion meet briefly some possible objections.

[1] 2 Chron. xvi, 14, states: "They buried him (Asa) in his own sepulchres, which he had hewn out for himself in the City of David."

The first is sentimental. The jumper would certainly make some havoc in penetrating a chamber, and might possibly crash down upon the skull of Solomon or Jehoiada, or some king whose bones had escaped the Chaldæans (Jer. viii, 1). This chance, however, is very small. Let us hope for the best.

A second objection is that Professor Ganneau locates the sepulchres very deep down in Ophel (1898, p. 167); but, as he also adds "several stories" to them, it may be that his top story would not be much lower than my fiftieth foot from the rock surface.

I regret to have been unable to consult his long essay on the tomb of David, and shall only be too glad if the first attempt of Dr. Bliss to find the royal sepulchres be soon followed by a second on Professor Ganneau's selected site, and by the actual discovery of their original entrance, so as to render needless my serious, though gothic, plan of attack.

I abstain from speculating on inscriptions, paintings, and other curiosities being found in the sepulchres of David.

Possibly it would be best to take areas 19 and not 20 feet square, as "19 feet" seems a frequent measurement in known tombs. This may represent *seven* cubits on either side from a middle point.

It would also save cost to trust for once to fortune by at first trying every other square, *i.e.*, boring areas of 40 (or rather 38) feet aside. We cannot tell what good luck might not bring to us. Afterwards, if necessary, fresh bores could reduce the areas to squares of 20 or 19 feet. Further, the narrower the bore, the less the cost.

THE PALESTINE EXPLORATION FUND.

NOTES AND NEWS.

The Committee deeply regret to record the deaths of Mr. William Simpson, R.I., and the Rev. William Wright, D.D., members of the Executive Committee, and also that of Mr. Henry Maudslay, a member of the General Committee.

Mr. William Simpson was one of the first of the Special Artist Correspondents of the London illustrated Press. During the course of the war with Russia he was sent out to the Crimea by Messrs. Colnaghi, of Pall Mall, for the purpose of making a series of illustrations of the war. Mr. Simpson went through the campaign, and upon his return from the East published two volumes of sketches, under the title of "Campaign in the East," and was honoured with a private audience by her Majesty, who gave him instructions to paint for her pictures of the troops as they returned from the seat of war. He travelled in India from 1859 to 1862, during which period he visited Kashmir and Thibet, making numerous sketches, and in 1867 his "India, Ancient and Modern," was offered to the public. In 1866 he joined the staff of the "Illustrated London News," and the same year attended the marriage of the late Tsar Alexander III. In 1868 he went out to Abyssinia with the Expedition under Sir Robert Napier, and two years later, upon the breaking out of the Franco-German War, was attached to the French Army. He was in Paris during the Commune, and a little later, in 1871-2, was in Pekin attending the marriage of the Emperor of China. From Pekin he visited the Great Wall, and while returning by way of America, was in time to follow the Modoc Indian War in California. He accompanied the Prince of Wales in 1875-6 on his visit to India; and,

upon the breaking out of the Afghan War in the autumn of 1878, was attached to Sir Samuel Browne's force through the Khyber Pass. He remained with the force at Jellalabad and Gundamuk, where he carried out a series of archæological investigations for the Viceroy, Lord Lytton, archæology having always been with him a favourite study, on which and architectural subjects he had written many papers. In 1883 he attended the coronation at Moscow of Alexander III, whose wedding he had illustrated seventeen years previously; and in 1884-5 again visited India in company with General Sir Peter Lumsden and the Afghan Boundary Commission in their mission to delimit the North-Western Boundary of Afghanistan. Mr. Simpson was a member of the Royal Institute of Painters in Water Colours, an honorary associate of the Royal Institute of British Architects, a member of the Royal Asiatic Society, and a Fellow of the Royal Geographical and other learned Societies. He had for many years been a member of the Executive Committee of the Fund, and his advice in connection with the illustrations of the publications was of great value. His amiable and gentle nature had endeared him to numerous friends, who deeply lament his loss.

Dr. Wright had for many years taken a warm and active interest in the work of the Fund. In early life he went as a missionary to Damascus, where he remained ten years, during which period he amassed a great store of information respecting that portion of the East, and made himself thoroughly familiar with the language and customs of its inhabitants. Besides his well-known work "The Empire of the Hittites," he was the author of "Palmyra and Zenobia," "The Brontés in Ireland," and innumerable contributions to the "Pall Mall Gazette," the "Sunday at Home," and other periodicals. For twenty-three years he had filled with great energy and ability the office of Editorial Superintendent of the British and Foreign Bible Society. He had for some time been in failing health, and died suddenly at his residence, Upper Norwood, on Monday, 31st July. He is lamented by a very large circle of attached friends.

Mr. Henry Maudslay was at one time a member of the firm of Maudslay, Sons and Field, and during that period of his

life, in recognition of the services rendered to the Portuguese Government, he was created by the King a Chevalier of the Order of Christ. He subsequently spent much time in Palestine, and carried out at his own expense some important excavations at Jerusalem on the south-west side of the city, uncovering the base of the rock-scarp which forms the boundary of the Protestant burial ground. A large portion of a mosaic pavement which he discovered at Jerusalem was presented by him to St. Paul's Cathedral, another portion being placed in Freemasons' Hall. For many years he had devoted himself entirely to work in connection with various charities and to acts of private benevolence. At one time he had a seat on the Executive Committee of the Fund.

Dr. Schick sends the following items of news from Jerusalem :—

The acoustic properties of the new German *Erlöserkirche*—the church consecrated in the presence of the German Emperor and Empress—proved to be very bad. People could not properly understand the preacher on account of the echo. Recently some thin network of the colour of the walls was hung up and spread over the higher parts in such a manner that it can hardly be seen from below, and now the hearing is much better. So something more will be done in the same way, and it is to be hoped the difficulty will be entirely removed.

An architect from Germany was here, sent, as I understand, by the Archbishop of Cologne, to see the place and gather local knowledge of building matters in order to be enabled to design a plan for a Roman Catholic Church, and other buildings to be erected on the place now generally called the Dormition,[1] which the German Emperor acquired from the Sultan and gave over to the German Catholics in such a way that the place will always belong to the Emperor, and stand under the German Consul, but the German Roman Catholics may use it for their purposes. It is now enclosed by a wall, and trenches having been made to ascertain the state of things underground, the rock was found about 10 feet below the surface on an average. Some cisterns

[1] Being the place where Mary the mother of Jesus died.

and walls were found, but not important ones; also pavements, conduits, or channels for water, and, above all, graves. It seems that the place was for a long time used as a burial ground. The bones were collected and will be buried again.

Our late German Consul, Herr von Tischendorf, has been removed to Algiers, and the son of Dr. Rosen, who was for many years Prussian Consul in Jerusalem, has come from Ispahan in his place. As I hear, he is married to an English lady. The Chancellor, Dr. Büge, was transferred to Beirût, and a new one has already come from Bagdad.

In one of my former reports I mentioned that the Greek Church and Convent of Mar Metri will be broken down and built up again for a school, &c. The work was begun some weeks ago. In digging new foundations the rock was found to be about 8–10 feet under the general flooring there, but as this was also about 5 feet lower than the new paved street, or 4 feet lower than the former surface of the street, laid down in the Ordnance Survey plan as 2,545 feet above the Mediterranean, the rock is here at a level of about 2,530 feet. Many human bones were found, so it seems that in some time of distress, perhaps during pestilence, the dead had to be buried there. As the plague is now in Egypt, the doctors here, when asked by the local government what precautions should be taken, advised that such excavations should be stopped, as the bones and earth might possibly contain contagious matter. So this work was forbidden till the rainy season.

This year locusts have appeared, first in the Jordan Valley, where a great many, being still young and not able to fly, were killed by order of the Government. Others were eaten by storks, and others, flying ones, appeared in the western plains, and were in great part driven by the wind into the sea. Still some remained in the country, appearing also in the neighbourhood of Jerusalem, and each family of those villages where they had come were required to bring 4 kilos. (or 8 lbs.) to the Government house at Jerusalem, or to pay 10 francs; so a great many were brought here and destroyed by fire in the court of the Serai. On the whole not much damage has been done to the crops.

The building of new houses, shops, &c., has repeatedly demanded immolations. Outside the Jaffa Gate, in digging foundations, the earth fell on the labourers, of whom three were killed, and higher up along the Jaffa road, where the Armenian Convent are building a row of 24 shops or magazines, and over them lodgings, a mason of their own community fell down from the wall and was killed.

The idea of making from the Jaffa Gate a broad and straight carriage road eastwards down to the Haram esh Sherîf, by which houses and shops would have to be broken away, originated with a Kady, who was here for a time and then removed to Mekka, as Kady there. The plans for such a work are made, but the amount of money which would have to be paid to the proprietors of the ground and buildings to be removed is so large that most likely the plan will not be carried out.

A number of moulds of the various objects found in the excavations have been received at the office of the Fund, consisting of inscribed weights, jar-handles, scarabs, &c. They can be seen, and casts of several can be obtained, on application to Mr. Armstrong.

The concluding part of the paper on "The Ancient Standards of Measure in the East," by Sir Charles Warren, K.C.B., R.E., is published in the current number.

Owing to the pressure on our space the continuation of Mr. Baldensperger's paper on "Woman in the East" and the publication of several other important communications are postponed.

The Committee have made arrangements with Dr. Schumacher for the prompt and regular transmission of information respecting archæological discoveries which may be made in carrying on the work of the Acre–Damascus railway. His first Report will be found at p. 339.

The concluding volume of Professor Ganneau's "Archæological Researches in Jerusalem and its Neighbourhood" is in the press, and will be published shortly.

In order to make up complete sets of the "Quarterly Statement," the Committee will be very glad to receive any of the back numbers.

Dr. Bliss's detailed account of his three years' work at Jerusalem, published as a separate volume, with the title "Excavations at Jerusalem, 1894–1897," and copiously illustrated with maps and plans, may be procured at the office of the Fund. Price to subscribers to the work of the Fund, 8*s.* 6*d.*, post free.

The "Flora of Syria, Palestine, and Sinai," by the Rev. George E. Post, M.D., Beirût, Syria, containing descriptions of all the Phaenogams and Acrogens of the region, and illustrated by 441 woodcuts, may be had at the office of the Fund, price 21*s.*

The income of the Society from June 23rd to September 23rd, 1899, was—from Annual Subscriptions and Donations, including Local Societies, £286 10*s.* 10*d.*; from sales of publications, &c., £160 17*s.* 0*d.*; total, £447 7*s.* 10*d.* The expenditure during the same period was £660 3*s.* 7*d.* On September 23rd the balance in the Bank was £248 12*s.* 5*d.*

Subscribers in U.S.A. to the work of the Fund will please note that they can procure copies of any of the publications from the Rev. Professor Theo. F. Wright, Honorary General Secretary to the Fund, 42, Quincy Street, Cambridge, Mass.

Professor T. Witton Davies, B.A., Ph.D., Baptist and University Colleges, Bangor, has kindly consented to act as Honorary Local Secretary.

The price of a complete set of the translations published by the Palestine Pilgrims' Text Society, in 13 volumes, with general index, bound in cloth, is £10 10*s.* A catalogue describing the contents of each volume can be had on application to the Secretary, 38, Conduit Street.

The Museum at the office of the Fund, at 38, Conduit Street (a few doors from Bond Street), is open to visitors every week-day from 10 o'clock till 5, except Saturdays, when it is closed at 2 p.m.

It may be well to mention that plans and photographs alluded to in the reports from Jerusalem and elsewhere cannot all be published, but all are preserved in the office of the Fund, where they may be seen by subscribers.

While desiring to give publicity to proposed identifications and other theories advanced by officers of the Fund and contributors to the pages of the *Quarterly Statement*, the Committee wish it to be distinctly understood that by publishing them in the *Quarterly Statement* they neither sanction nor adopt them.

Subscribers who do not receive the *Quarterly Statement* regularly are asked to send a note to the Acting Secretary. Great care is taken to forward each number to those who are entitled to receive it, but changes of address and other causes occasionally give rise to omissions.

Tourists are cordially invited to visit the Loan Collection of "Antiques" in the Jerusalem Association Room of the Palestine Exploration Fund, opposite the Tower of David, Jerusalem. Hours: 8 to 12, and 2 to 6. Maps of Palestine and Palestine Exploration Fund publications are kept for sale.

Photographs of Dr. Schick's models (1) of the Temple of Solomon, (2) of the Herodian Temple, (3) of the Haram Area during the Christian occupation of Jerusalem, and (4) of the Haram Area as it is at present, have been received at the office of the Fund. Sets of these photographs, with an explanation by Dr. Schick, can be purchased by applying to the Secretary, 38, Conduit Street, W.

Branch Associations of the Bible Society, all Sunday Schools within the Sunday School Institute, the Sunday School Union, and the Wesleyan Sunday School Institute, will please observe that by a special Resolution of the Committee they will henceforth be treated as subscribers and be allowed to purchase the books and maps (by application only to the Secretary) at reduced price.

The Committee of the Palestine Exploration Fund desire to make clear that they have no book on their List of Publications called "Picturesque Palestine," nor is any person authorised to represent this book as published by the Society; nor has the Society any book-hawkers in its employment.

The Committee will be glad to receive donations of Books to the Library of the Fund, which already contains many works of great value relating to Palestine and other Bible Lands. A catalogue of Books in the Library will be found in the July *Quarterly Statement*, 1893.

The Committee acknowledge with thanks the following donations to the Library of the Fund :—

One set of the "Memoirs" of the Survey of Western Palestine, with maps; one set of the "Survey of Palestine"; one set of the *Quarterly Statements;* one set of the Publications of the Fund; one set of the Palestine Pilgrims' Text translations; "Ordnance Survey of Jerusalem — Notes," 1865; "Jerusalem," Vols. I and II (Pierotti); "Temple of the Jews" (Ferguson); "Jerusalem, Bethany, and Bethlehem" (Porter); "Travels in Syria and the Holy Land" (Burckhardt); "Jerusalem" (Ferguson); "Walks about Jerusalem" (Bartlett); "Land of Israel" (Tristram); "Journey Round the Dead Sea" (De Saulcy); "Horeb and Jerusalem" (Sandie); "Biblical Researches" (Robinson); "Sinai and Palestine" (Stanley); "Guide Book" (Murray); "Holy City" (Williams); "Ancient Jerusalem" (Thrupp); "Syria and Palestine" (Van de Velde); "Siege of Jerusalem" (Lewin); "Unexplored Syria" (Burton and Drake); "Desert of the Exodus" (Palmer); "Moabite Stone" (Ginsburg); "Holy Places of Jerusalem" (Lewis); "Holy Sepulchre" (Ferguson); "Land of Gilead" (Oliphant); "East of Jordan" (Merrill); "Temple of the Tomb" (Warren); "Travels in Egypt, Arabia, Petra, and the Holy Land" (Stevens); "Holy Sepulchre" (Willis); "Land and the Book" (Thomson); "Expedition to the Dead Sea" (Lynch); "Early Travels in Palestine" (Bond); "Chronicles of the Crusades" (Bond); "Ockley's History of the Saracens" (Bond); "Land of Moab" (Tristram); "Eusebius Eccl. History" (Bond); "Handbook to the Bible" (Conder); "The Holy City Jerusalem" (Russel Forbes); "A Journey from Aleppo to Jerusalem at Easter, A.D. 1697" (Maundrell); "Jerusalem Liberata" (Tasso); "Pellegrinaggio di Gierusalemme, 1615"; portfolios of odd plans, illustrations, &c. From the Family of the late Professor T. Hayter Lewis.

"Receuil d'Archéologie Orientale." Publié par M. Clermont-Ganneau. Tome III, Livraisons 14–19. *Sommaire :*—§ 40. Orphée-Nebo à Mabboug et Apollon; § 41. La lettre de Jésus au roi Abgar, la Koutbi juive adorée à Edesse et la Mezouzah. § 42. La Palestine au commencement du VI^{e} siècle et les *Plérophories* de Jean Rufus, évêque de Maioumas; § 43. Notes d'épigraphie palmyrénienne; § 44. Inscription grecque d'Edesse. § 45. La relation du voyage du Sultan Qâit-bây en Syrie; § 46. Itinéraire d'un pèlerin français du XIV^{e} siècle de Damas à Nagilouse; § 47. Gezer et ses environs, nouveaux relevés (Pl. III, IV, V, et VI); § 48. Création d'un fonds spécial pour l'acquisition d'antiquités; §49. Jehovah, Seigneur du Sinaï; § 50. Gath et Gath-Rimmon; § 51. Le tombeau de Dja'far, cousin-germain de Mahomet; § 52. Nouveau lychnarion à inscription coufique (Pl. VII); § 53. Une inscription du calife Hichâm (an 110 de l'Hégire (Pl. VIII); § 54. El-Kahf et la Caverne des Sept-Dormants.

"Corpus Inscriptionum Semiticarum." Tomus I: Pars Prima Fasciculus Secundus, pp. 117–216; Quartus, pp. 353–456; Secundus (Tab.

XV–XXXVI); Quartus (Tab. L–LVII). Tomus I: Pars Secunda Fasciculus Primus, pp. 1–168; Secundus, pp. 169–304; Primus (Tab. I–XIX); Secundus (Tab. XX–XLIV). Tomus I: Pars Quarta Fasciculus Primus, pp. 1–102; Secundus, pp. 103–174; Primus (Tab. I–XII); Secundus (Tab. XIII–XVIII). Tomus II: Pars Prima Fasciculus Primus, pp. 1–112; Secundus, pp. 113–272; Primus (Tab. I–XI); Secundus (Tab. XII–XXXVI).

"The Decalogue and Criticism." By Rev. George Livingstone Robinson, Ph.D. From the Author.

"Plantæ Postianæ," Fasciculus III, IV, V, VI, VII, VIII. By Dr. George E. Post. From the Author.

The authorised lecturers for the Society are—

AMERICA.

Professor Theodore F. Wright, Ph.D., 42, Quincy Street, Cambridge, Mass., Honorary General Secretary of the Palestine Exploration Fund for the United States. His subjects are as follows:—

(1) *The Buried City of Jerusalem.*
(2) *Discoveries in Palestine.*

ENGLAND.

The Rev. Thomas Harrison, F.R.G.S., The Vicarage, Appledore, Ashford, Kent. His subjects are as follows:—

(1) *Research and Discovery in the Holy Land.*
(2) *Bible Scenes in the Light of Modern Science.*
(3) *The Survey of Eastern Palestine.*
(4) *In the Track of the Israelites from Egypt to Canaan.*
(5) *The Jordan Valley, the Dead Sea, and the Cities of the Plain.*
(6) *The Recovery of Jerusalem*—(*Excavations in* 1894).
(7) *The Recovery of Lachish and the Hebrew Conquest of Palestine.*
(8) *Archæological Illustrations of the Bible.* (Specially adapted for Sunday School Teachers.)

N.B.—All these Lectures are illustrated by specially prepared lantern slides.

The Rev. Charles Harris, M.A., F.R.G.S., Appledore, Ashford, Kent. (All Lectures illustrated by lantern slides.) His subjects are as follows:—

(1) *Modern Discoveries in Palestine.*
(2) *Stories in Stone; or, New Light on the Old Testament.*
(3) *Underground Jerusalem; or, With the Explorer in* 1895.

Bible Stories from the Monuments, or Old Testament History in the Light of Modern Research:—

(4) A. *The Story of Joseph; or, Life in Ancient Egypt.*
(5) B. *The Story of Moses; or, Through the Desert to the Promised Land.*
(6) C. *The Story of Joshua; or, The Buried City of Lachish.*
(7) D. *The Story of Sennacherib; or, Scenes of Assyrian Warfare.*
(8) E. *The Story of the Hittites; or, A Lost Nation Found.*

Scotland.

The Rev. James Smith, B.D., F.S.A., F.R.G.S., St. George's-in-the-West Parish, Aberdeen. (All Lectures are illustrated with lantern slides, many of which are coloured.) His subjects are as follows :—

(1) *The Palestine Exploration Fund.*
(2) *A Pilgrimage to Palestine.*
(3) *Jerusalem—Ancient and Modern.*
(4) *The Temple Area, as it now is.*
(5) *The Church of the Holy Sepulchre.*
(6) *A Visit to Bethlehem and Hebron.*
(7) *Jericho, Jordan, and the Dead Sea.*

The Rev. W. Burnet Thomson, M.A., B.D., Galashiels, N.B. His subjects are as follows :—

(1) *The City of the Great King; or, Jerusalem and the Explorer.*
(2) *The Temple, the Sepulchre, and Calvary.*
(3) *Southern Palestine.*
(4) *Jerusalem to Damascus.*
(5) *Palestine and Jesus Christ (for children).*
(6) *The Bible and the Monuments. Discoveries in Ancient Land.*

All illustrated with lantern slides.

Wales.

The Rev. J. Llewelyn Thomas, M.A., Aberpergwm, Glynneath, South Wales. His subjects are as follows :—

(1) *Explorations in Judea.*
(2) *Research and Discovery in Samaria and Galilee.*
(3) *In Bible Lands; a Narrative of Personal Experiences.*
(4) *The Reconstruction of Jerusalem.*
(5) *Problems of Palestine.*

ANNUAL MEETING.

The Annual Meeting was held in the Lecturing Theatre of the Royal Institution, Albemarle Street, on July 11th, 1899. Lord Amherst of Hackney occupied the chair.

There were present:—Admiral Sir Erasmus Ommanney, Lord Eustace Cecil, Mr. James Glaisher, Dr. Ginsburg, Colonel Watson, Dr. Chaplin, Mr. J. D. Crace, Rev. W. J. Stracey, Mr. William Simpson, Mr. James Melrose, Mr. H. C. Kay, Professor Hull, Dr. Löwy, Rev. W. H. Rogers, D.D., Rev. William Fleming, General Sir Charles Wilson, Mr. Walter Morrison, M.P., Professor Sayce, Canon Dalton, Mr. Basil Woodd Smith, and others.

Lord Amherst.—Ladies and gentlemen, I am sure it is with the very greatest pleasure that we welcome here on this occasion the Chairman of the Executive Committee, Mr. Glaisher, but he has asked me to perform the actual duties of the chairmanship for him on this occasion. The first thing I have to announce is that letters of regret for not being able to attend have been received from His Grace the Archbishop of Canterbury, Viscount Sidmouth, the Master of Trinity College, Cambridge, and others. I will now ask Canon Dalton to read the Report.

Canon Dalton read a short summary and abstract of the Report, of which printed copies had previously been circulated among the audience, and which is here given in full.

Gentlemen,

In resigning the office to which they were appointed at the last Annual Meeting, your Executive Committee have the honour to present the following Report:—

They have held twenty-two meetings for the transaction of business.

The excavations determined upon last year on the historical site of Tell es-Sâfi, supposed, since 1857, by many Biblical students to be the ancient Gath (*cf.* Colonel Conder's valuable notes, *Quarterly Statement*, 1880, pp. 214–221, Professor G. A. Smith's "Historical Geography of the Holy Land," pp. 194 to 197 and p. 227, and Sir Charles Warren's article "Gath," in the second volume of Hastings's "Dict. of the Bible," 1899,

pp. 113, 114), have been successfully begun, and are now being carried out by the Fund under Dr. Bliss and Mr. Macalister.

After returning from his visit to America, and seeing his volume on the excavations at Jerusalem through the press, Dr. Bliss proceeded to Palestine, and arrived at Jerusalem on August 30th, 1898, where he was joined by Mr. Macalister.

The area of 10 kilometres within which excavations by the Fund have been sanctioned by the Sublime Porte for two years includes the three ancient sites Tell Zakarîya (Survey, "Memoirs," vol. ii, p. 441), Tell es-Sâfi (*id.*, pp. 415, 416, 440), and Tell ej-Judeiyideh (Survey, "Memoirs," vol. iii, p. 291), each situated at one of the three angles of a hollow triangle with its apex towards the south at the last-mentioned Tell. After a careful reconnaissance of the ground it was decided to commence operation at Tell Zakarîya. "The place has every appearance of being an ancient and important site, though as yet unidentified," 1874 ("Memoirs," vol. ii, p. 441). Work was here carried on from October 26th until Christmas (when the rains rendered it impossible for a time), and was resumed on March 20th, and continued for five weeks, till April 22nd, after which the exploring party moved on to Tell es-Sâfi, which lies about five miles due west of Tell Zakarîya.

Dr. Bliss sends the following general account of the work of the year:—

"Tell Zakarîya is a hill rising 350 feet above the Vale of Elah, which sweeps around its eastern and northern sides. It stands about half way in a direct line between Jerusalem and Ascalon, being in the heart of the Shephelah, or low hilly country, that lies between the Maritime Plain and the high Central Range. The summit is fairly flat, and has a generally triangular shape, measuring from base to apex about 1,000 feet, with a maximum breadth of about 400 feet. At the south-east corner is 'a raised area (as at Tell Jezer) on which apparently the citadel once stood' ('Memoirs,' vol. ii, p. 441).

"I would once more here emphasise the invaluable assistance given to excavators in Palestine by the researches in pottery made by Dr. Petrie at Tell el-Hesy in 1890. The results he arrived at there were amply confirmed in the more extended excavations afterwards conducted on the same site. With this key in our hands, from

a merely superficial survey of the pottery of Tell Zakarîya and of the heaps of fragments there collected, I inferred that the place had been inhabited in Jewish times, and that the Roman occupation had been brief. How fully these inferences were confirmed will be seen from the summary of the excavations.

"On the raised portion we have found a large fortress, of irregular shape, measuring 220 feet on the west side, and about 120 feet on the north. The walls are about 6 feet thick, built without mortar. At the angles are four towers, with two extra towers on the northern and western sides, all proved to have been of later construction than the main walls. This building stands upon the rock to a height varying from 16 feet to about 20 feet; the top of its ruined walls crops out in places from the present surface of the soil. About half the area included has been examined down to the rock. The *débris* thus exhumed has proved to consist of two strata: one a pre-Israelite stratum, in which the foundations of the fortress were sunk; and the other a Jewish stratum, slightly disturbed in Roman times. The fortress thus may possibly be the work of King Rehoboam, who built so many cities for defence."

[Their names are given in 2 Chron. xi, 6–10, and they formed a girdle of fenced cities round Jerusalem. Socoh, Gath, Lachish, Azekah, and Hebron are among them. This line of fortresses, which protected Jerusalem on the west and south, was forced by Sheshonk, the first king of the twenty-second or Bubastite dynasty, when, in Rehoboam's fifth year, he took Jerusalem (2 Chron. xii, 2–5), as Jeroboam's ally and former friend in Egypt. His well-known record of that invasion, with a long list of captured Jewish forts (most of which have been identified by Colonel Conder, *Quarterly Statement*, 1893, pp. 245–246), is inscribed on the walls of Karnak.]

"In the lowest stratum, near the rock, was found a buried jar, broken but *in situ*, containing, among other Egyptian amulets, scarabs of Thothmes III and his great-grandson Amenhotep III," [the fifth and eighth kings of the eighteenth dynasty, and both conquerors of Palestine. It was the son of the latter monarch to whom the Tell el-Amarna tablets were addressed. These Pharaohs reigned about 300 years before a commonly received date of the Exodus, and about 600 years before Sheshonk and Jeroboam]. "Jar-handles inscribed in Hebrew 'Belonging to the

King of Hebron' and 'Belonging to the King of Shocoh' also occurred." [Rather translate, "For the King. Hebron"; "For the King. Shocoh"; *i.e.*, "For the King's service," "made at, or sent from, Hebron and Shocoh."] "Pre-Israelite and Jewish pottery was found in large quantities. Objects in stone, bronze, iron, and clay were numerous.

"The excavation of about half of the interior of the fortress proved that this was merely an enclosure for the protection of houses within. On a site where stone was always the main material of construction, exact plans of the various occupations cannot be given as in the case of a series of mud-brick towns, where one set of buildings rises from the ruins of another, but a study of the walls, floorings, pit-ovens, &c., of Tell Zakarîya has proved that there were at least four mutually excluding occupations. The Roman pottery was very scarce, consisting of only 2 to 3 per cent. of the fragments found to a maximum depth of 7 feet.

"In a brief summary of our four months' digging on this site it is impossible to go into details and proofs, but my reports have shown that the place was founded in pre-Israelite times, twice fortified in the Jewish period, and inhabited for a brief time by the Romans. What, then, is this place? From topographical considerations it has been identified with the Azekah of Scripture by Van de Velde, Sir George Grove, and Sir Charles Wilson (Articles 'Azekah' and 'Vale of Elah,' Smith's 'Dict. of the Bible,' vol. i, pp. 304 and 890, ed. 1893); and with them I myself would agree.

"Before leaving Tell Zakarîya, I must refer to the indefatigable zeal of Mr. Macalister in examining the numerous rock-cut chambers in the slopes of the Tell." [Some of these may perhaps have contained "the store of victual, of oil and wine," mentioned 2 Chron. xii, 11.] "One system has at least 49 rooms connected by shafts and creep-passages, of which he has made careful plans and sections. The exploration of these was complicated by the *débris* with which they are partly filled, and by the foul atmosphere lurking in their recesses.

"I am bound also to refer to the Tell Zakarîya workmen, and to the villagers in general. Between us and them there exists a feeling of genuine friendship and cordiality. The invitations to dinner were almost embarrassing in their frequency, and we

were obliged to acknowledge our obligations in one grand farewell party, when some 80 people sat in groups in the moonlight, and partook of roast lamb, rice, and other simple fare.

"On May 4th, after a slight interruption, due to ill-health and other reasons, we broke ground at Tell es-Sâfi (which is about 600 feet lower than Tell Zakarîya, but still 700 feet above the level of the Mediterranean), and have worked there continuously till June 12th, the date of writing. Owing to the stagnant water which usually is found in the stream-bed all through the summer and autumn, Tell-es-Sâfi has an evil reputation for malaria, well justified by the debilitated appearance of the inhabitants. Fortunately this is a singularly healthful year, and thus far we have not suffered. Moreover, the weather has been exceptionally cool, and our camp is open to every breeze of heaven. The importance of this site has struck everyone travelling through the district. Its white cliffs on the north are visible from a long distance. Its strategic qualities were recognised by the Crusaders who erected here in 1144 A.D. the fortress of Blanche-Garde (*Alba specula*), which doubtless took its name from these same white cliffs. It was dismantled by Saladin in 1191 A.D., and had apparently four towers of equal height. The cliffs rise from the river-bed some 150 feet, and from their top the ground slopes rapidly upwards for another 150 feet to the Wely, dedicated to el Khudr, which crowns the southern end. The summit has not the flat surface of Tell Zakarîya, but slopes down from the Wely to the north-east plateau. On plan the summit has the shape of the moon in its first quarter. The boundary of the ancient city on the south, east, and west has been determined by the discovery of a massive rampart which, by its construction, must antedate Crusading times. The town was irregular in shape, measuring about 400 yards in maximum length and about 200 yards in maximum breadth, and thus contained a space about six times the size of the fort on Tell Zakarîya. The city walls are 12 feet thick, built without mortar, like those at Tell Zakarîya, but they are twice as thick, and twice as high; they are preserved in places to a height of 33 feet, and show a system of buttresses regularly spaced. They rest not on the rock, but on some 6 feet to 10 feet of *débris*, which is characterised by very early pre-Israelite pottery. As their massive foundations must have been sunk in a considerable

quantity of soil we gather that they were not erected much before Jewish times. The gate has still to be found. Unfortunately the area within the ancient city is so encumbered by cemeteries and by the modern village that the space available for excavation is limited. However, shafts sunk in the accessible portions soon revealed the nature and depth of the accumulation. A large clearance to the rock on the north-east plateau has proved the existence of four strata of *débris;* a pre-Israelite stratum on the rock earlier than the lowest stratum at Tell Zakarîya; a later pre-Israelite stratum; a stratum coinciding with Jewish times; and a Crusading stratum. These results were obtained mainly by the study of thousands of potsherds and confirmed by associated objects. According to the testimony of the pottery the place appears to have had a continuous history from the eighteenth to the fourth century B.C., to have been founded long before the conquest of the land by Joshua, and to have been inhabited continuously till a late Jewish period, when it was deserted till the time of the Crusaders.

"Chance is a favouring element in excavation. Often the excavator while searching for one thing finds another. In tracing the ancient wall we found one portion buried by an old rubbish heap, on which, curiously enough, the modern rubbish heap is superimposed. The older heap revealed an extraordinary mixture of objects: potsherds ranging from early pre-Israelite to late Greek; busts and other fragments of statuettes, probably Greek, pottery masks, figurines in large variety, great quantities of beads, Egyptian amulets with one fragment of a *Ushabti* figure inscribed, an inscribed jar-handle with two lines of Hebrew writing, &c. So precious a mine called for exhaustive working, but the long wished-for tablets and steles are yet to seek. Without these it will be impossible definitely to establish the identity of Tell es-Sâfi with Gath. This identification has usually been based on the ground of the position and importance of the site. Our excavations have proved the existence of a city quite as ancient as Gath, on a site where Gath may reasonably be looked for, fortified at about the period when Gath was made a city of defence. That the Tell contains inscriptions that will positively prove it to be Gath is quite within the range of possibilities. That these may be found by us is a desire felt, I am sure, by every subscriber to the Fund.

"As I have stated before, my theory of excavation in Palestine is to choose a site which is undoubtedly ancient and then to turn over as much *débris* as possible on that site. That is what we have been doing both at Tell Zakarîya and at Tell es-Sâfi, and our ability to do so in the future depends largely upon the subscribers to the Fund."

A week later than this report Dr. Bliss writes again to the Committee, under date of June 19th, that "in the large clearance which he has made on the north-east plateau at Tell es-Sâfi, at a depth of 17 feet beneath the soil he has uncovered what appears to be an old Canaanite temple or high-place with three standing stones, or menhirs, surrounded by a rude enclosure made of mud and rubble. The three stones are set in a line directly east and west. They are very rude and vary in height from 6 feet to 8 feet. They stand embedded in the layer of pre-Israelite pottery." On such sacred standing-stones (in A.V. translated "pillars") libations of blood, milk, honey, or water were poured. Dolmens, "stone-tables" or altars, and cromlechs "stone circles" (or Gilgals) still exist in great number east of the Jordan, but west of that river, with the exception of a few examples in Galilee, none have hitherto been found. They seem to have been destroyed by the Judean kings, Hezekiah and Josiah, in obedience to the injunctions of the Book of Deuteronomy to demolish the religious emblems of the Canaanites. Hence, if this is really a high place of the Canaanites, it had probably become buried in this *débris* before the time of Hezekiah, or otherwise it would not have escaped destruction. For a complete description of such sacrificial stones and altars, *see* Robertson Smith, "Religion of the Semites," pp. 200 to 212, ed. 1894.

The inscribed jar-handles, weights, and other objects which were found in the course of the excavations have proved to be of great interest, and notes with reference to them by Professor Clermont-Ganneau, Professor Hilprecht, and Professor Sayce have appeared in the *Quarterly Statement*.

Mr. Macalister, besides the admirable plans and drawings to illustrate the excavations and the objects therein found, has contributed scholarly and careful reports on the rock cuttings of Tell Zakarîya, on a Byzantine Church at Umm er Rûs, and on

a font with Greek inscription at Malkathah. His assistance to Dr. Bliss has thus been simply invaluable.

By this series of excavations, together with those conducted from 1890 to 1893 at Tell el-Hesy, the Fund has demonstrated the existence to this day, on the ancient sites of Old Testament history, of remains dating back to those periods, and even beyond them into pre-historic times. It is scarcely necessary to dwell on the important results that are likely to ensue, not only to the scholar and the antiquary, but also to every intelligent student of Holy Writ, if such excavations can be adequately supported and continuously and more extensively carried out.

This consideration brings us at once to the last point in our Report—the pecuniary position of the Fund. Our annual income last year from all sources was about £3,000, and of this, we are grateful to note, about one-seventh part was contributed by our American friends in the United States. The present excavations cost about £120 a month, and at the present moment we have a balance in the bank of about £100: scarcely sufficient for one more month's work.

May we not with confidence appeal for further and enlarged support?

Dr. Conrad Schick, in spite of his advancing age and frequent ill health, has contributed to the periodical of the Fund many important reports and articles.

In the spring of this year, when Sir Charles Wilson was about to undertake a tour in Palestine and adjoining districts, he was requested by the Executive Committee to make an official inspection of the excavations. This he kindly did, and since his return has furnished several full and most valuable reports, which should be of much service both regarding the present and future operations of the Society.

Your Executive Committee have also to record their thanks to many scholars and investigators who have sent to the *Quarterly Statement* articles of much interest.

Professor Clermont-Ganneau has contributed various notes on many topics, and especially an article on a newly-discovered Hebrew and Greek inscription relating to the boundary of Gezer.

Mr. Archibald C. Dickie has furnished an article, with plans, of the Lower Church of St. John, Jerusalem; Colonel Conder, several on the antiquities of the Pentateuch and the Books of Joshua and Judges, another in illustration of the Book of Job, &c.; the Rev. J. E. Hanauer, articles on "Tell er Reesh" and "The Ruins of the Herodian Jericho"; Mr. Mark Sykes, a "Narrative of a Journey East of Jebel ed-Druse"; and Mr. E. T. Newton, a report on certain bones brought thence by Mr. Sykes; Sir Charles Warren an elaborate and important paper on "The Ancient Standards of Weight and Measure in the East." Also Mr. Gray Hill, Professor Theodore Wright, the Rev. W. F. Birch, and others, have kindly sent various interesting communications.

Mr. P. J. Baldensperger's noteworthy series of papers on "Woman in the East," in which he describes the daily life, customs, religion, and folk-lore of the different classes of the female population of Palestine, is in course of publication in the *Quarterly Statement.*

Our chairman, Mr. Glaisher, has continued to prepare for the press the Meteorological Observations taken for the Fund at Jerusalem and Tiberias.

The publications of the Fund during the year, besides the *Quarterly Statements*, have been "Excavations at Jerusalem, 1894–1897," new editions of "Mound of Many Cities," "Judas Maccabæus," the 12 and 20 sheet maps of the Old and New Testament, and the Collotype print of the Raised Map.

Since the last Annual Meeting 109 names have been added to the list of subscribers, and 169 have been lost through death and otherwise.

Our cordial thanks are due to the honorary local secretaries for their help in collecting and forwarding subscriptions to the office of the Fund.

The amount received in subscriptions and from sale of books in 1898 from the Rev. Professor Theodore F. Wright, Honorary General Secretary for the United States of America, was £363 6*s.* 5*d.*

The Committee have to deplore the loss by death since the last Annual Meeting of the following members of the General Committee:—His Grace the Duke of Northumberland, Professor T. Hayter Lewis, Mr. John Mason Cook, Mr. William Tipping.

The following is the Treasurer's Statement of Receipts and Expenditure during the year 1898:—

The income of the Fund for 1898 amounted to £2,600 5*s.* 10*d.*, made up as follows:—

From Legacy left by the late Mr. Henry Smiles, £100; from Donations and Subscriptions, £1,871 2*s.* 6*d.*; from sale of publications, £582 9*s.* 3*d.*; from Lectures, mainly delivered by Dr. Bliss in America while waiting for the Firman, £46 14*s.* 1*d.*

At the end of 1897 there was a balance in the bank of £645 5*s.* 2*d.*, making the total amount available for the year, £3,245 11*s.* 0*d.*

The expenditure was:—

On exploration, £695 5*s.* 4*d.* Owing to the delay in getting the Firman the excavation work was not begun until late in the year.

On printing and binding the *Quarterly Statement*, the new work "Excavations at Jerusalem," the new editions of "Mound of Many Cities" and of "Judas Maccabæus," &c., £652 9*s.* 11*d.* On maps, lithographs, illustrations, photographs, &c., £145 11*s.* 11*d.* Against these two sums the Fund received from the sale of all publications, £582 9*s.* 3*d.*, as stated above.

On advertising, insurance, stationery, &c., £83 2*s.* 7½*d.*

On postage of books, maps, &c., including the *Quarterly Statement*, £121 1*s.* 10½*d.*

The management, including rent of office, cost of removing from 24, Hanover Square, dilapidations, new furniture, repairs, &c., £873 10*s.* 3*d.*

At the end of the year the balance in the Bank was £674 9*s.* 1*d.*

Special expenses were incurred during the year in consequence of the office being removed to 38, Conduit Street, W. During the quarter in which this took place rent had to be paid for both the old and present offices.

Assets.	£	*s.*	*d.*
Balance in Bank, December 31st, 1898.. ..	674	9	1
Stock of Publications in hand, Surveying Instruments, Show Cases, Furniture, &c.			
In addition there is the valuable library and the unique collection of antiques, models, &c.			

Liabilities.	£	*s.*	*d.*
Printer's Bill	105	15	1
Current Expenses.			

Walter Morrison, *Treasurer.*

The Museum has recently been rearranged at the office of the Fund, 38, Conduit Street (a few doors from Bond Street), and is open to visitors every week-day from 10 o'clock till 5, except Saturdays, when it is closed at 2 p.m. Mr. George Armstrong, Acting Secretary, is in attendance there during the above-mentioned hours, and will always be happy to answer any inquiries regarding the operations or publications of the Fund.

Mr. Morrison.—I have much pleasure in moving the adoption of the Report, an abstract of which has been read by Canon Dalton. You will see that it is mainly an account of the operations of Dr. Bliss and his colleague, Mr. Macalister. Dr. Bliss has had some training as an explorer under Dr. Petrie, and has now had a considerable amount of experience, and is getting to know where to look for things, what to look for, and what to deduce from them when he has found them. The work he is engaged upon is very interesting indeed, and I see Mr. Armstrong has put some of the results on the table. There is plenty of work yet to do. It is fortunate that we took up the work of exploring Palestine thirty years ago, and that we devoted at first our principal efforts to Jerusalem, because it would be a much more difficult thing to excavate in Jerusalem now than it was then, seeing that the population is now about three times what it was some years ago. We have provided the world with a map of Palestine which is as good as the Ordnance Map of England. But there still remain all over the country a large number of mounds which mark the sites of ancient towns which have been destroyed, and we hope that the public will supply us with a sufficient amount of money to go on with our excavations, and to thoroughly exhaust the work which lies before us. It is the same in Palestine as in many other cases: the trained explorer sees all sorts of things which the ordinary person does not see. I recollect very well when the late Mr. James Fergusson, one of the members of our Committee, was very strong upon the desirability of looking out for rude stone monuments, such as Stonehenge and the like. No one had ever seen them in Palestine, and we asked our explorer especially to look out for them. Colonel Conder afterwards found 400 on Mount Pisgah alone. But the financial question is one which particularly concerns me as the Treasurer of the Fund. As you have heard from Canon Dalton, our funds have got into a low

condition, as the balance we had at the bank in January no longer exists. It is not a time of the year in which money is likely to flow in, and it will be rather difficult to keep our works going unless we get some substantial aid from the public. I have great pleasure in proposing the adoption of the Report.

Dr. Löwy, in seconding the adoption of the Report, said:—We are under the greatest obligation to the promoters of the exploration in Palestine for the increasing light they help to throw on Biblical and secular history. When we look upon the geographical position of Palestine, we are at once reminded that it was a regular thoroughfare for the early war expeditions undertaken by the Babylonians against the Egyptians, and *vice versâ*. The independence of the Palestinian districts was jeopardised, now by the rulers on the Nile, and now by the more aggressive rulers near the Euphrates. The instructive *Quarterly Statements* have recently informed us that in the Holy Land a hieroglyphic inscription had been unearthed in a *Tell* which dates back to the days of Thothmes III, thus showing that about 1500 years B.C. the heavy hand of Egypt had taken hold of that country. This hieroglyphic relic apparently commemorates a conquest which wrested the possession of Palestine from the power of Babylon. On the other hand we have the inestimable testimony given by the Tell el-Amarna tile inscriptions that the Babylonians had in remote times well-distributed sub-kings in Palestine and Syria. Information thus afforded to us renders us truly grateful to the zealous promoters of Biblical researches.

Adverting to the *Tells* which are mentioned five times in the Hebrew scriptures, independently of three proper names, "*Tell-Melach*" (*i.e.*, salt mound), "*Tell-Charsha*" (*i.e.*, forest mound), and "*Tell-Abib*" (*i.e.*, spring mound), Dr. Löwy pointed out that the Hebrews employed the word *Tell* mainly in the sense of a ruined fort or fortress, and they more than once alluded to the fact that such mounds might be overtopped by new erections which again were liable to become ruins in the process of time. One of the Talmudical sections speaks of a Jewish owner of a *Tell*. In the folk-lore of post-biblical ages Jewish writers refer to ruins as haunts and homes of *shedim* (evil spirits); but such localities do not appear under the name of *Tell* but of *churbah*.

The Report was unanimously adopted.

The Chairman.—We are now coming to what is one of the great objects of our meeting, and I have great pleasure in calling on Sir Charles Wilson to give us an address on his recent travels in Moab and Edom.

Sir Charles Wilson then delivered an address, illustrated by the limelight, on his recent visit to Palestine, more especially the land east of the Jordan. (*See* p. 304.)

The Chairman.—Ladies and gentlemen, before we proceed to the rest of the routine business of our annual meeting, I am sure you will think that I ought to take this opportunity of asking you all to return a vote of thanks to Sir Charles Wilson for the very interesting lecture he has given us this afternoon. (Applause.) I can assure him that this great gathering is mainly owing to the anticipation of the lecture which we have just heard. It is always interesting to hear travels described by the travellers themselves, but more especially when they are accompanied by such excellent photographs as have been shown on the screen, because many of us are not perhaps likely to have the fortune of being able to visit the sights themselves, and although drawings made by skilful artists give one a very good and true idea of the scenes they depict, yet the photographs themselves must give the most accurate representation that at present can be made. There is no part of the world I suppose where civilisation and desolation come so close together throughout the country. We have heard, and it has been very properly urged by our treasurer, Mr. Morrison, that we ought to continue our excavations whilst we have opportunity, and we hope to obtain funds to do so. Owing to the advance of civilisation many relics of history are unfortunately being destroyed throughout the country, and there has been an immense advance in the condition of Palestine since the work of the Fund began. I had the pleasure of visiting the country before the Palestine Exploration Fund came into existence. I also saw again the same places in 1894, and owing to the difference which the social progress of the country had occasioned I could hardly recognise many of the places. But there is one thing I should like to say for whatever my testimony is worth, and that is, that although with civilisation there come roads and railroads, I do not think that a railroad ever yet spoilt a country. I was horrified

by the idea of a railway up to the Holy City of Jerusalem; but I must say that when I travelled by it and saw how it approached the city I was quite surprised that such a modern innovation could have produced so little alteration in the aspect of the country. It is to the interest of us all that civilisation should advance, and we hope that our friends will support us by giving us the means of carrying on our excavations at the same rate. We have done a great deal during the last thirty-four years, but there is still a great deal more to do. We know that wherever these mounds exist they hide something of interest, perhaps of far greater interest than we could possibly imagine, and that nothing can tell us what lies there except excavations, which can only be carried on at considerable cost. There have been liberal contributions in the past, and I am sure there will be in the future; and if anything will bring them in more abundantly it is such instructive lectures as we have heard from Sir Charles Wilson. I am sure you will all wish me to accord a most hearty vote of thanks to him. (Carried by acclamation.)

The Chairman.—I have now to move that the following gentlemen be asked to become members of the General Committee:—His Grace the Duke of Northumberland, K.G.; Professor W. Ramsay, University of Aberdeen; Dr. Conrad Schick, Jerusalem; George Harvie Johnston, Esq., Edinburgh.

The Rev. W. F. Stracey.—Ladies and gentlemen, I beg to propose the re-election of the Executive Committee, and in doing so I venture to submit to their judgment whether it would not be a good plan to charge something for the *Quarterly Statement*, instead of distributing it gratuitously. I think it would add very much to our funds if a certain sum, say two shillings and sixpence, was charged for each *Quarterly Statement*. It must take a very large amount out of the small funds at the disposal of the Association to print and publish the book. I beg to move the re-election of the Executive Committee.

Mr. Morrison.—With regard to the charge for the *Quarterly Statement*, we send that *Quarterly Statement* free to subscribers of half a guinea, which is really charging them two shillings and sixpence for each number. I have myself sometimes thought that half a guinea was too low a subscription for the *Quarterly Statement* to be supplied free.

The Rev. W. F. Stracey.—What does the charge come to?

Mr. Morrison.—It is in the printed report. Printing comes to £652, though that includes all the other books, as well as the *Quarterly Statement*, but not its postage.

The Chairman.—No doubt the Executive Committee will take into consideration what has been mentioned by Mr. Stracey. Of course any way in which we can reasonably increase the funds we shall be anxious to adopt. That I have no doubt will be a matter for the consideration of the Committee when they next meet.

Professor E. Hull.—I have great pleasure in seconding the appointment of the Executive Committee. Might I add what an extreme gratification it has been to me to be able to listen to Sir Charles Wilson's lecture? Some of the places which he described, and which were represented by his photographs, are those with which my own memory is closely connected, and also, I am sure, that of our Secretary, Mr. Armstrong. Sir Charles Wilson has added very largely to our knowledge of the country which the expedition of 1883–4 visited, and districts which we should very much like to have visited if it had been possible.

The Chairman.—In asking you to sanction the re-election of our Executive Committee I would also ask you to accord a cordial vote of thanks to Dr. Bliss, Mr. Macalister, and Dr. Schick for their valuable services.

Mr. Glaisher.—Ladies and gentlemen, I should much like to ask you to return your thanks to Mr. Morrison, our Treasurer. He was one of our original members, and he has taken a most lively interest in everything connected with the Palestine Fund from then till now. I should like also to thank Sir Walter Besant, our Honorary Secretary, who has taken an herculean task upon himself elsewhere that allows him but little time to be with us, but that little time is given and we must thank him for it. There is yet another, and that is our Acting Secretary, who seems never to tire. He keeps me *au fait* in everything that is proceeding in the Society, whether I can attend a committee meeting or not. I think those three gentlemen most richly deserve our thanks, and, sir, I beg to move that the best thanks of this meeting be given to them. (Applause.)

The Chairman.—I am sure the Chairman of the Committee will convey your thanks to these gentlemen.

Lord Eustace Cecil.—Before we part I should like to propose a vote of thanks to our Chairman, and in doing so I beg to say that I think it is a very great improvement our having met in this Institution to-day. I recollect last year we went to a room which was hardly big enough to hold the gentlemen who attended, and I think we had hardly any ladies present. I hope this arrangement will be continued next year, and that by so doing we shall attract even a larger audience than we have had to-day. I should like to have made some remarks upon Sir Charles Wilson's lecture, but I feel—the thermometer being at 80, and there being a great many more gentlemen better qualified to speak upon the matter than I am—it will probably detain people too long. I am an old traveller; I was in Palestine thirty years ago, and I had a most interesting time, but the part that Sir Charles Wilson described to us to-day was quite a sealed book then, because the country was so insecure. I was anxious to ask Sir Charles Wilson how he was able to get about in the way he did. I know two or three gentlemen tried it at the time of which I am speaking, and recollect perfectly well on one occasion a gentleman getting with his wife as far as Jericho, where, as the story was, he was stripped of his clothes and returned clothed in sheets of "The Times" newspaper. Whether that is true or not I do not know; but I know they were plundered, and there was a great deal of difficulty in getting about the country that Sir Charles Wilson has described. Another point I should like to have asked is whether anybody is following the really very laudable practice of Baron Rothschild in encouraging his co-religionists to go to the land of Moab and Edom. We have heard from Sir Charles Wilson that parts of it are most fruitful, and that a good deal of it certainly might be brought back into a state of cultivation. I think that is just the sort of thing that, if it goes out to the public, will make people think whether it is not possible from every point of view to encourage Jewish immigration to that side of the water, and to restore the country to what it was in its early days. These are some of the ideas that occur to me. I should have liked to have gone into the subject at much greater length, but I will not trouble the meeting with any further remarks, and will only record my sincere thanks to Sir Charles Wilson for having popularised by his lecture a most interesting country and a most interesting people. May I, then, propose that we offer our best

thanks to Lord Amherst for presiding, and I only hope that in years to come we may have a large attendance at our Annual Meeting, and that that will add very considerably to our subscribers in the future.

Mr. Glaisher having seconded the vote, it was carried by acclamation.

The Chairman.—I am sure, ladies and gentlemen, I thank you very much for the kind thanks you have given me for presiding to-day. It has been a very great pleasure to me to do so. I did accept the office two or three years ago, and my name was put down; but I was prevented from attending because I was then lying on a bed of sickness. I thank you very much for having allowed me to occupy the chair, which would have been so much more ably filled by Mr. Glaisher. But I will not yield to anybody in the interest I have taken from the commencement of the Palestine Fund in everything connected with it. I had the pleasure of attending the first meeting in June, 1865, and I have attended a great number of the meetings since. I am glad to see that a few of the members of the Executive who were with us when the Fund first started are still amongst us, and are as zealous in the work as they always have been.

Dr. Ginsburg.—Before we separate I am sure you will agree with me that we owe our best thanks to our veteran Chairman of the Executive Committee, Mr. Glaisher. (Cheers.)

Mr. Simpson.—I shall have very great pleasure in seconding that.

The Chairman.—I am sure that is unanimously carried on all sides. (Applause.)

Mr. Glaisher.—Accept my best thanks for your kindness in thanking me.

Lord Amherst.—Before the meeting closes I am sure we all wish to record our thanks to the managers of the Royal Institution for so kindly granting us the use of their theatre for this our annual gathering.

The proceedings then terminated.

ADDRESS DELIVERED AT THE ANNUAL MEETING OF THE FUND.

By Major-General Sir C. W. Wilson, K.C.B., F.R.S., &c.

Lord Amherst, ladies, and gentlemen, before giving you a brief account of my visit to Moab, I wish to make a few remarks on some points that came under my notice in other parts of Palestine.

I visited the excavations that were being made for the Fund at Tell Zakarîya, and can endorse what Mr. Morrison has said with regard to Dr. Bliss and Mr. Macalister. They are both good men, and take great interest in their work. The ruins on Tell Zakarîya are those of a small town and acropolis which have been rebuilt three or four times; and in my opinion the last reconstruction took place during the time of the Maccabees. One very interesting feature, which probably dates from the earliest settlement on the Tell, is the number of rock-hewn chambers that communicate with each other. These almost certainly formed a place of refuge for the inhabitants in the case of hostile raids which could not be met in the field. The excavations which are carried out by the Fund are of great importance, for Palestine is changing more rapidly than anyone who has not been there in recent years can possibly imagine.

I am sorry to say that the native tomb-hunter, who has done and is still doing irreparable mischief in Egypt, is now at work in Palestine. At Susiyeh, the ancient Hippos, east of the Sea of Galilee, a large number of gold ornaments, terra-cotta vessels, and other objects of art have been taken by the fellahîn from tombs which they have broken into and rifled. The finds are sold secretly in different parts of the country, from fear of the local authorities, and they pass into private collections where it is impossible to trace them. Many of the articles that have thus been dispersed are probably of great archæological interest and value, for Hippos was settled by Macedonians after the conquest of Syria by Alexander.

One great change in Palestine is due to what I might almost call a mediæval revival. During the last 20 years there has been

a remarkable scramble for "holy places," and this has resulted in the erection of numerous churches and monasteries throughout the country. There is now hardly any "site" in Palestine that is not occupied by a monastery or a church. Most of these buildings are in the very worst taste, and in the erection of some of them much damage has been done to the remains of more ancient structures. At Jerusalem, for instance, the Greeks, whilst excavating in the Muristân to the south of the Church of the Holy Sepulchre, uncovered the foundations of the Church of St. Mary the Less, which was built by the Latins in the twelfth century. These, I regret to say, were wantonly destroyed, and several capitals from Constantine's basilica which had been re-used by the builders of the church, shared the same fate. On the site of the church was found a valuable reliquary, displaying great artistic taste, which is now preserved in the Greek Treasury in the Church of the Holy Sepulchre. The reliquary is of interest to Englishmen, for a relic of Oswald, the Anglo-Saxon King of Northumbria in the seventh century, occupies the place of honour amongst small fragments of the true cross and other relics. It must have been buried or hastily concealed, when the city was taken by Saladin, by someone who lost his life at that time.

At Tell Hûm, which many authorities believe to be the site of Capernaum, the synagogue that I partially excavated in 1866 has been much damaged. The Franciscans, who have built a small hospice, or monastery, amidst the ruins of the town, have included the building within the walls of their garden, and have planted mulberry trees over it.

At Medeba, east of Jordan, the Greeks have partly destroyed a large map of Palestine, Egypt, Sinai, and Mesopotamia, in mosaic, which was probably made in the early part of the fifth century. Some of the most interesting portions of the map have been completely destroyed, but even in its fragmentary state it is one of the most valuable geographical discoveries of recent years in Palestine.

Perhaps the greatest change is that which has been made in the aspect of several districts by the labours of the Jewish colonists. I must confess that I was quite unprepared for the excellent results that have been already obtained by the colonists. They have turned land which I remember as waste, and almost

desert, into smiling gardens, orchards, and vineyards, or covered it with heavy crops of wheat and barley. In 1882, when I rode from the Sea of Galilee to the waters of Merom there was scarcely a trace of cultivation in the Jordan Valley. This year I found the valley, where not planted with almond and olive trees, a waving mass of corn. At Ekron, a colony which every traveller in Palestine should visit, there are large plantations of olive, almond, pomegranate, and other fruit trees. Nowhere can be seen more clearly what the country might become under a proper system of cultivation, and what it probably was before the Arab conquest. It has been stated that Jews do not take kindly to agriculture. The question seems to be one of training, and much has been done in this direction by the Agricultural School of the Alliance Israèlite at Jaffa, and by Baron Edmond de Rothschild, who has had several of the most promising young Jews educated at the best agricultural schools in France. In some places I saw Jewish colonists working in the fields as if their hearts were really in the work. The results obtained by the colonists have had a marked influence on the native tillers of the soil, who, whether Christian or Moslem, are gradually adopting more scientific methods of cultivation in their fields and vineyards.

I may here allude to an interesting struggle that is going on between the Russian and the Orthodox Greek Churches. The Russians have opened a large number of schools in Palestine, in which Russian is taught, and their ostensible object is to create a national Arab Church, on the lines of the Bulgarian Church. This policy is opposed in every possible way by the Greek Orthodox Church, which relies on the support of the Turkish Government. This year the Greeks, to show their loyalty to the Sultan, and possibly to annoy the Russians, hoisted the Turkish flag on the tower of the Church of the Holy Sepulchre during the Easter ceremonies, at which a Russian Admiral and a detachment of his sailors were present. It is, I believe, the first occasion upon which a Turkish flag has been hoisted on a Christian Church, and as it marks a new departure, a photograph of the church with the flag flying may be of interest.

My visit to Moab and Edom was very hurried, but it enabled me to examine the broad geographical features of the country, and to realise their influence on its history. I was fortunate in having as my companion Mr. C. Hornstein, the head master of

the Christ Church School for Jewish boys at Jerusalem,[1] who had previously visited Kerak and Petra, and was received by everyone as an old friend. His knowledge of the people and their language smoothed all difficulties, and to his skill as a photographer we are indebted for the beautiful photographs that will be shown on the screen.

Moab and Edom, roughly speaking, form part of a high-lying plateau, which on the west breaks down to the Dead Sea and the 'Arabah in a succession of abrupt cliffs and terraces, and on the east slopes gradually downwards until it merges in the great expanse of the Syrian Desert. From Jebel Neba (2,643 feet), on the north, there is a steady rise to the downs above Petra (5,320 feet), on the south.

The district owes much of its characteristic scenery to the fracture of the earth's crust which formed the Jordan Valley, and the great depression that extends southwards to the Red Sea. The effect of this fracture has been to displace the strata vertically, so that those on the eastern side of the deep, trough-like valley have been relatively elevated. At the base of the eastern escarpment, near Petra, red sandstone and conglomerate, capped by fossiliferous limestone of the carboniferous period, rest on a foundation of old crystalline rocks. The limestone is succeeded by a soft cretaceous sandstone, of variegated colours, that represents the Nubian sandstone, and this is surmounted by a cretaceous limestone with thick beds of flint, which underlies the surface soil of the plateau, and corresponds to the chalk formation of the British Isles. In certain localities—as, for instance, east of *Jebel Shihân*, and east of *Wâdy Shobek*—the limestone passes under sheets of basaltic lava. North of Petra the older rocks gradually disappear, but along the east shore of the Dead Sea the Nubian sandstone is always visible, and is deeply cut into by the lateral valleys, which are really fractures branching off from the main fracture already mentioned.

The general aspect of the limestone plateau is not unlike that of the Sussex Downs or the Yorkshire Wolds. The plateau affords excellent pasture and, where cultivated, yields good crops of barley. There are a few scattered trees, and at one spot,

[1] I have to thank the Rev. A. H. Kelk, Incumbent of Christ Church, and the Committee of the London Society for Promoting Christianity amongst the Jews, for kindly granting Mr. Hornstein permission to accompany me.

between Shobek and Petra, there is an oak wood of some size. In the Bible these downs are called the *Mishor* (A.V., "plain country") of Edom and Moab. The basalt districts, with their rich, productive soil, are the *Sadeh* (A.V., "field") of the two countries. The lower desert region to the east is the *Midbar* (A.V., "wilderness"); to the north, after the rains, it affords sufficient vegetation for the camels, sheep, and goats of the Bedawin; but southwards, in the vicinity of M'aân, the level surface is covered with loose black flints, and the desert assumes a most forbidding aspect. The soft Nubian sandstone, which weathers into quaint, picturesque forms, offers great facilities for excavation, and in it are hewn the temples, dwelling-places, and tombs of Petra, el-Barid, and el-Beidha.

The valleys which drain the plateau are at first broad and open, but they afterwards suddenly break down into wild, rocky ravines, and, where they pass out through rifts in the escarpment to the Dead Sea and the 'Arabah, they become deep chasms. These ravines, which are only passable at certain points, have in all ages greatly influenced the direction of the lines of communication. In most of them there are perennial streams of water fringed with oleanders and fairly stocked with fish. In the deep rifts, where the ruddy-coloured sandstone is exposed, the rock scenery is wild and grand. The three most important valleys which, with their tributaries, drain by far the larger portion of the plateau, are: *Wâdy el-Mojib* (the Arnon), which formed a natural boundary between Israel and Moab; *Wâdy el-Ahsi* or *Hesi* (the brook Zered), which separated Moab from Edom; and *Wâdy el-Ithm*, which parted Edom from Midian. Other deeply-cut valleys are *Wâdy Zerka Mâ'aîn*, in which lie the hot sulphur springs of Callirrhoe, *Wâdy Kerak*, *Wâdy Tufileh*, *Wâdy Shobek*, and *Wâdy Mûsâ*, through which ran the Roman road *viâ* Petra to the Gulf of 'Akabah.

Edom is divided into two separate districts by a remarkable break in the hills that form the western edge of the plateau, and not by a valley. This break, from its proximity to Shobek, I venture to call the "Shobek Gap." The northern district, *Jebeil*, is the Gebal of Psalm lxxxiii, 7, which at a later period gave its name, Gobolitis, or Gebalene, to the whole country. The southern is *Sherah*, or Edom proper. Another interesting feature in Edom is the separation of the bare sandstone ridge, of which Mount Hor

is the culminating point, from the *massif* of the plateau. This is clearly seen when looking down upon Mount Hor from the edge of the plateau above Petra. To this ridge the name Mount Seir seems specially applicable.

There are no springs except in the valleys. The inhabitants of the towns on the plateau depended for their water supply upon the rainfall, which was collected in rock-hewn cisterns and open reservoirs. In several localities the soil is good and well adapted to the growth of cereals, but the population is so sparse that only a small proportion of the available land has been cultivated. Wherever there is water, as at Kerak, Tufîleh, Elji, and M'aân, the olive, fig, pomegranate, and vine thrive well, and at Elji the poplar is grown for its wood. The traces of ancient cultivation are very apparent in the dams and retaining walls which were built across the valleys to keep the soil from being washed away by the winter rains. The climate is colder than that of Western Palestine; snowstorms are not uncommon in winter and spring, and at those seasons the easterly winds are extremely cold. Whilst we were suffering from cold the easterly winds, driving the heated air of the Jordan valley westward, produced great heat and a sirocco wind at Jerusalem. The summer is hot, but on the plateau the nights are always cool. In Moab there appears to be a fair rainfall, but in the southern portions of Edom there is little rain.

There are numerous remains of the ancient roads, and the great Roman road which ran from Medeba to the Gulf of 'Akabah can be traced as far as Petra. Many of the milestones, with much-worn inscriptions, remain where they have fallen, and in places the roadway is still quite perfect. In the *Wâdy Mojib*, where the descent on the north side is 1,860 feet and the ascent on the south side 2,040 feet, and also in *Wâdy el-Hesi*, where the descent and ascent are respectively 2,450 feet and 2,800 feet, the gradients were laid out with great skill. Unfortunately the old roadway has long been destroyed, and there is now only a track for pack animals. Another main road followed nearly the line of the present Haj road, which runs near the edge of the desert and does not cross any deep ravine. These two lines of communication were connected by minor branch roads. During the Roman period the roads were protected by guard houses, or small military posts; and the whole country was protected from

the incursions of the nomads by a chain of forts that ran from north to south, and were apparently garrisoned by the legion which seems to have been quartered at *Lejjûn*. From an inscription on one of the forts, *Kasr Bishîr*, it would appear that the line of fortifications was strengthened and restored in the early part of the fourth century.

The large number of ruins show that the country at one time had a large settled population. Most of them, it is true, mark the sites of villages or small towns; but some, as for instance those at er-Rabba, Datras, and Umm er-Rasas, are the remains of important cities. Very few of the ancient sites have been occupied since the Arab conquest, and they consequently offer a favourable field for exploration. This is specially the case with *er-Rabba* (Ar of Moab), where excavations would lead to important discoveries.

I obtained some new Greek inscriptions at Kerak, and possibly a few new Nabathean inscriptions from Petra and its vicinity. Many others, perhaps Moabite, and certainly Nabathean and Greek, would be found by excavation. I heard of several inscriptions that had been buried by their finders, but was unable to see them. The Turkish occupation has made excavation easy and possible; but it has also, by giving protection from the nomads, encouraged the reoccupation of deserted sites, and so opened the way to the destruction of ancient remains. It is, therefore, most important that excavations should be carried out at an early date. The destruction of a great part of the Medeba mosaic is a warning that should not be neglected.

It may be of interest to mention here that the route of the Israelites from the Gulf of 'Akabah to the Jordan lies within very narrow limits. After ascending *Wâdy Ithm*, they must have camped near *M'aân*, where there is an abundant supply of water. They then probably followed the Haj road to the stream in *Wâdy el-Hesi*, and after crossing the upper part of the *Seil es-S'aideh* turned west by *Umm er-Rasas* to *Dhibân*. From this last place northward to Mount Nebo the road is easy and well defined.

We crossed the Jordan by a bridge on or near the site of the flying bridge represented on the Medeba mosaic, and, after making our way across the "plains of Moab," commenced the ascent of the hills on the east. For some distance we followed the Roman road by the side of which are several fallen milestones, and then turned off to pass the night at a Bedawi camp on the slopes of

Pisgah, above the springs (*'Ayûn Mûsâ*) which are generally identified with Ashdoth Pisgah. Next morning we ascended Pisgah (*Râs Sîâghah*), but heavy clouds covered the western hills and we saw little of the extensive view which the hill commands.

From Pisgah we rode over rich arable land to *Mâ'aîn* (Beth-baal-meon), where we found the ruins occupied by Christians from Kerak, who had repaired some of the old houses. They had uncovered nothing of importance, but it is a place where discoveries may be expected, and it should be occasionally visited. We next descended to the hot sulphur springs in the gorge of the *Wâdy Zerka Mâ'aîn* (Callirrhoe), which were visited by Herod the Great. The absence of any remains of importance possibly indicates that visitors encamped when going through a course of baths. A steep climb of about 2,800 feet took us to *M'akaur* (Machaerus); and thence we rode by *Khurbet Attarûs*, and *Jebel Attarûs* to the Roman road which we struck a little to the south of *Libb* and followed to the *Wâdy Wâleh* and the *Mojib*. Before reaching the *Wâleh* we passed a Roman post with a group of milestones, and a similar group was noticed shortly before we reached the stream of the Mojib. At the Mojib we found that the road on both banks had been greatly improved by the Turkish soldiers, and that the passage of the great rift was now comparatively easy.

Leaving the south side of the rift, where there is now a Turkish guard-house, we soon entered the rich basaltic plain that stretches southward past *Rabba* (Ar of Moab) to the vicinity of Kerak. At this last place we were hospitably received by the Turkish officers, and by the Greek Archimandrite, in whose house we lodged. Every facility was given for visiting the castle and all parts of the town, and an examination of them seemed to show that though in many places the lower portions of the walls and towers may be Roman, or even earlier, the castle and the town walls are, as a whole, the work of the Crusaders and an extremely fine example of mediæval fortification. With the exception of necessary repairs, few additions have been made to the works since the place was held against the might of Saladin by that audacious freebooter Renaud de Chatillon, who was slain after the disastrous battle of Hattin. The inscriptions of Bibars were manifestly inserted in towers which he repaired but did not build. It is not easy to determine the limit of the pre-Roman city and fortress, but it was probably conterminous with that of the

present town. The four rock-hewn tunnels which were formerly the only entrances to the town appear to be very ancient and to have belonged to the old Moabite city. In one of them we came across an instance of the careless disposal of the dead in the bodies of a number of children that had been simply wrapped in a cloth and laid upon the ledges of rock. There are a few Roman remains and Greek inscriptions in the town, and I was able to copy some new inscriptions that had been found in a tomb by the Rev. Mr. Forder. Amongst the people of Kerak the Christians, who, like the Moslems, take to their tents in the summer, are of special interest.

Travelling south from Kerak we came to the spot where Jaafar et-Taiyar, Muhammad's cousin; Zeid, his adopted son; and Abdullah ibn Rawâha, the poet, who were killed at the battle of Moteh, lie buried. The battle, of which a picturesque description has come down to us, was the first in which the followers of Muhammad met a Roman army. They were sharply defeated with the loss of their three leaders, and were only saved from complete destruction by the genius of Khalid, who was soon to be the conqueror of Syria. Some doubt had been expressed as to the truth of the tradition that Jaafar was buried at this place, and excavations were made under a young Turkish officer. An inscription in Kufic was found which left no doubt as to the accuracy of the tradition. The Arabs assembled at M'aân and, marching by the Roman road through Datras, met the Imperial army on the plain between *Jaafar* and *Kerak*. The scene that followed can be realised from the descriptions of the battle of Omdurman, where the Baggara charged and fought with all the impetuosity of their Arab ancestors. Jaafar led the final charge, banner in hand, and as he rushed forward to perish in the ranks of the Christians he chanted the following words:—"Paradise! How fair a resting place. Cold is the water there, and sweet the shade! Rome! Rome! thine hour of tribulation draweth nigh. When I close with her, I will strike her down to the ground."

Leaving *Jaafar* we crossed the deep *Wâdy el-Hesi*, and, entering the district of *Jebeil* (Gebal), visited *Tufileh* (Tophel). The place is still inhabited, and is noted for the number of its springs, and for its olive groves, its fig trees, and its productive gardens. From the top of the little castle that crowns the hill there is a view of exceptional beauty and interest over the Dead Sea. From *Tufileh* our route led past *Buseira* (Bozrah) and *Gharandel* (Arindela) to

a break in the hills that separates Gebal from Edom proper, and to a basaltic plain which answers well to the "field" (*sadeh*) of Edom. From the plain we descended sharply to the bed of *Wâdy Shobek*, and followed it up to the base of the hill upon which stands Shobek, the Mons Regalis of the Crusaders. The castle was built by Baldwin I in a position of great natural strength within easy reach of the great caravan road from Cairo to Damascus. It thus commanded the principal line of communication between the capitals of Egypt and Syria, and several fruitless attempts to take it were made by Saladin. The fortress, before the introduction of fire-arms, must have been impregnable, and it only fell when the garrison were nearly starved and there was no hope of relief. The walls are very fine, and there are remains of the Church of the Crusaders and other buildings. The most curious feature is a deep well with, so it is said, 375 steps to the water. There are several springs from which water is led away to irrigate a number of terraced gardens. Nothing older than the period of the Crusades was seen, but the site is such an important one that it must always have been occupied, and was probably the home of one of the Dukes of Edom.

Soon after re-crossing *Wâdy Shobek*, on our way southward, we again struck the Roman road near *'Ain Nejel*, a fine spring which retains the name of Negla, a station mentioned in the "Itinerary" of the road to Petra. The ruins near the spring are probably those of Negla. We left the Roman road before it entered *Wâdy Mûsa*, and, turning to the right, rode through a large wood of oaks to the edge of the plateau above the 'Arabah. The view from this point was most extensive and interesting. Petra lay almost at our feet. Mount Hor was several hundred feet below us, and the detached ridge of which it forms part could be traced far to the north and south. Beyond Mount Hor lay the 'Arabah, and in the far distance the wide expanse of the desert of the Tîh.

We entered Petra by the *Sik*, and lived in the *Khazneh* whilst visiting the rock-hewn monuments which have been so often described. We were able to ascend Mount Hor, and make a careful examination and take photographs of the interior of Aaron's tomb. The present structure has evidently taken the place of a Byzantine shrine, for we found one stone with a cross upon it, and another with a mutilated Greek inscription. On leaving Petra we paid a short visit to *el-Beidha* and *el-Barid*, where the rock excavations,

though on a smaller scale, are almost as interesting as those of Petra. The style of the monuments is not so florid, and to this they probably owe their better preservation. There is no water in this section of the sandstone ridge, and elaborate arrangements were made to collect the rainfall and conduct it into rock-hewn cisterns. We copied a few Nabathean inscriptions, but were not able to give the place the careful examination that it requires. The whole sandstone ridge appears to be full of rock-hewn tombs and dwelling-places, and any traveller who could devote a few weeks to its exploration would reap a rich harvest of inscriptions.

Our route from el-Barid lay through the large village of *Elji* and its well-watered gardens, and up a narrow valley to the western edge of the plateau. Thence we descended to *M'aân*, which lies well out on the flint desert, and is one of the principal stations on the Haj road from Damascus to Mecca. There are two M'aâns: the larger, *M'aân Kibleh*, lies to the south, and is the seat of the kaimakam; the smaller, *M'aân Shamiyeh*, lies to the north. Both have an abundance of water, from springs and small streams that have their sources some distance to the west, and serve to irrigate extensive gardens. The Serai is in a castle which, according to an inscription, was built by Sultan Selim I, who paid much attention to the stations on the Haj road. Here and there in the village there are capitals and worked stones, which show that the place was occupied during the Roman period. About a mile from M'aân there is a large reservoir, which was formerly supplied by an aqueduct from the stream at *M'aân Shamiyeh*. This tank and the ruins near it probably date from the time of the Damascus khalifs,[1] who carried out extensive works for the convenience of the Haj. At present the pilgrims camp on the desert between the two M'aâns, and obtain their water from the streams. *M'aân*, which is three days' journey from the Gulf of 'Akabah, must have been one of the stations of the Israelites on their way to the Holy Land. It is possibly the place from which the Maonites, Mehunim, or Meunim took their name, or it may have taken its name from them.

From M'aân we rode across the flint desert to *Kalah Aneyzeh*, where there are a small castle and a reservoir, both in bad repair,

[1] I could find nothing distinctively Roman, and it seems improbable that the Romans would have constructed works of this kind for a military station near an abundant supply of water. The ruins have nothing in common with those of the military stations at *Lejjûn* and *Odruh*.

and the next day to *Kalah el-Ahsi*, where we turned to the left to camp by a stream, "the brook Zered," in the *Wâdy el-Ahsi*. Here we were obliged to return to Kerak to have the animals reshod—a change in the programme which took us through Datras, where there are the ruins of two temples and of a large town. Datras is apparently the Thorma of the "Itinerary," a place otherwise little known to us, though it must have been an important town and occupied a commanding position near the northern edge of Wâdy el-Ahsi. The water supply, as in nearly all the towns on the plateau, was derived from the rainfall stored in rock-hewn cisterns.

Leaving Kerak we rode out by the ruins of *Chinar*, and *Adr* or *Adar*, to *Lejjûn*, a Roman fortified camp which was planned by Dr. Bliss and described by him in the *Quarterly Statement* for July, 1895. The camp is well situated in open ground in *Wâdy Lejjûn*, near the source of one of the principal feeders of the Arnon. From its name it was probably the headquarters of the Legion that garrisoned the line of posts along the desert frontier of Moab and Edom. On a spur of the hills above the camp are the ruins of a building on a raised platform, which one of the Bedawîn tribes uses as a place of burial. The tribe apparently has little regard for the dead, since the bodies of men and women are laid on the ruins in the flowing white or blue garments they wore in life and left to the tender mercies of dogs and hyenas.

About two and a quarter hours after crossing Wâdy Lejjûn we passed several rectangular stone structures called *Rijum Rishan*. These buildings, which are common on the downs, are usually situated on the top of hills and ridges. They have two chambers covered with stone slabs, and are apparently tombs similar to those in the *Wâdy Feirân* in Sinai. Later we crossed *Wâdy el-Midhad*, and then rode over the downs to a camp of Salaita Bedawîn, where we passed the night. Next day we visited *Kasr Bishir*, of which Dr. Bliss has also given a plan, and then rode to the extensive ruins of *Umm er-Rasas*. Here I was able to examine the construction of the stone houses and cisterns which are roofed with large flat slabs resting on parallel rows of closely spaced arches built without mortar. Within the fortified enclosure I noticed the remains of two churches, and on the outside there were the ruins of some large buildings. Great care was taken to retain the soil in the shallow valleys and on the slopes of the hills near the town by massive walls, and to collect the

rainfall in numerous well-constructed cisterns. About a mile from the ruins is the curious tower which has been the subject of much speculation. It apparently stood in the open court of a small monastery, of which there are considerable remains, and was perhaps a Stylite tower. Its position, much lower than that of the town, does not favour the view that it was a watch tower. A rude flight of steps, now blocked by fallen stones, winds round the inside. If *Umm er-Rasas* be, as has been suggested, the archiepiscopal city of Μέμφις or Μέμφου, then the tower is probably that of Sylitus. From the tower we rode over the downs to Wâdy Themed, and thence by the interesting ruins of *Nittle*, a town with stone houses similar to those at Umm er-Rasas, to Medeba.

At Medeba I examined the mosaic map which, when perfect, included Egypt, Sinai, Palestine, Syria, and part of Mesopotamia. It is, in its mutilated state, an interesting illustration of the condition of the country before the Arab conquest, and of the views that then prevailed with regard to sites of Biblical interest. The colours in the mosaic, when wetted, are still quite fresh, and in the plan of Jerusalem I was able to see several details that I had not noticed on any copy. There is, unfortunately, no facsimile of the mosaic in colour. Such a copy is much to be desired, for the colours, especially in the large towns, appear to be used conventionally and in accordance with fixed rules. There is a low railing round the mosaic, but it does not completely protect it, and it is desirable that a coloured facsimile should be made at an early date. There are several other fine mosaics at Medeba, of which one is dated; but the era from which the date is counted is at present unknown. From Medeba we returned by Jericho to Jerusalem.

Moab and Edom, though not strictly forming part of the Holy Land, are so closely connected with it that they should be surveyed and examined with the same accuracy as Western Palestine, and excavations should be made before ruins and inscriptions have been destroyed by squatters. The topographical features are interesting; there is much of importance to the geologist; and the discovery of inscriptions like that of King Mesha on the "Moabite stone," is not only possible but probable. The occupation of the country by the Turks has facilitated exploration, and the sooner it is undertaken the greater will be the results.

SECOND REPORT ON THE EXCAVATIONS AT TELL ES-ṢÂFI.

By F. J. Bliss, Ph.D.

The present report brings the record of the work done to about the middle of July, when a break of a few weeks was made, owing to the summer's heat. We are able to announce the discovery of a building, evidently a small temple of pre-Israelite date, enclosing three standing-stones. Owing to the limited space available for illustration in the *Statements*, the current reports must necessarily be incomplete, as full descriptions of unfigured objects are apt to lose much of their significance. I may mention here that Mr. Macalister has filled over 80 sheets with drawings of the objects and fragments found up to the present time, a careful catalogue of which is preserved. I mention this fact to show that the length of this report is not at all indicative of the amount of work done.

In my first report on the work at Tell es-Ṣâfi (p. 188) I announced that we had marked out an area, 80 feet by 90, on the narrow plateau at the north-east of the Tell, north and east of the graveyard, with the intention of clearing the whole area to the rock. The plan was to work this in three sections, each 80 feet by 30. At the date of posting that report the first section had been completed (rock having been found at an average depth of 26 feet), and the second section had been deepened to about 13 feet. By the end of June this second portion had been finished, and, as there was no time to complete the third proposed section before the summer's break, we decided to suspend operations on the plateau, especially as it seemed best, before we left, to restore the land to the level condition in which we had found it. The dimensions of the area excavated indicate how laborious a task this was. In our last season's work the utmost care was taken to prevent the overlooking of minute objects, a large part of the earth being sifted. On re-handling the earth at the time of filling up, it

was a gratification to find that the number of objects that appeared was almost *nil*, though especial *bukhsheesh* was offered to the discoverer.

In the course of digging this large pit, 80 feet long, 60 feet broad, and at an average 26 feet deep, we came across the foundations of buildings which represent at least four mutually excluding occupations. The main material used was stone, but here and there were patches of fallen and decayed mud-brick, indicating that this material had been employed for the partition walls. In one place seven courses of a brick wall were found. I may mention here that our suggestion, made on p. 195 of the last *Quarterly*, that the city wall to the south of the Wely consisted of mud-brick on stone foundations, has been verified, some 40 feet having been traced.

The four systems of construction just mentioned were as follows:—(1) Immediately under the surface appeared a series of rudely-constructed large chambers, with walls consisting chiefly of rubble laid in mortar, but containing some dressed stones, which showed the unmistakable fine diagonal chiselling of the Crusaders. Several voussoirs scattered about had the same chiselling. The foundations of these walls were from 4 to 6 feet below the surface. (2) At a depth ranging from 11 feet to 14 feet occurred several walls, consisting of roughly-covered rubble laid in mud, ranging in breadth from 2 to 4 feet. (3) At a depth ranging from 15 to 18 feet were the foundations of a third series of chambers of similar construction. Some of these walls may have been used in period No. 2, but that their date of building was antecedent will be shown in our discussion. (4) From a depth of 20 feet to the rock were found several isolated walls, representing the ruins of the earliest period, and apparently having no connection with the wallings above.

As only two-thirds of the proposed clearance have been completed, it would be unedifying to publish at present the partial plan of the Crusading chambers, especially as these showed no features of importance. At a depth of from 18 to 20 feet, however, were found three upright monoliths standing upon foot-stones, together with the foot-stones of others, all

in situ, which are of such special interest that a report upon them cannot be delayed. That these stones were enclosed by walls is clear; that some of the walls found in close connection with the stones could not have had anything to do with these is also clear. We have already intimated that while the walls whose foundations occur at a depth ranging from 11 feet to 18 feet may be resolved into two periods (the second and third of the series), part of the earlier system appears to have been used at the later period. Accordingly it has seemed best to publish two plans side by side (Plate I), one (No. I) showing all the walls just mentioned, and the other (No. II) showing only the more ancient walls which formed the temple surrounding the monoliths. As the depths of rude foundations of any given building may vary from point to point, and as these rubble walls show no distinct signs of bond, the task of elimination was delicate, and hence it will be necessary to give the process by which such elimination was effected. The delicacy of the problem was enhanced by the fact that the area including these walls was excavated in two portions, the western portion having been filled up (owing to practical exigencies) before we suspected the existence of the temple. All walls, of course, had carefully been planned. It should be noted that in the reconstruction of the temple, while we have omitted walls, in no case have we added walls, but have merely carried on by dotted lines such ruined walls as actually exist.[1]

First as to the monoliths themselves. In cross section they are irregularly oval, the surface being roughly flaked down. They consist of soft limestone, and are so much weathered that no signs of the tool used are left. Stone *a* tapers to a point; stones *b* and *c* taper slightly, but have comparatively flat tops. The heights of the three stones differ, but their tops are almost in the same horizontal plane; *a* is 5 feet 10 inches high, cross dimensions 30 inches by 24 inches; *b* is 6 feet 5 inches high, cross dimensions 27 inches by 19 inches; *c* is 7 feet 1 inch high, cross dimensions 31 inches by 21 inches; *a* rests on a

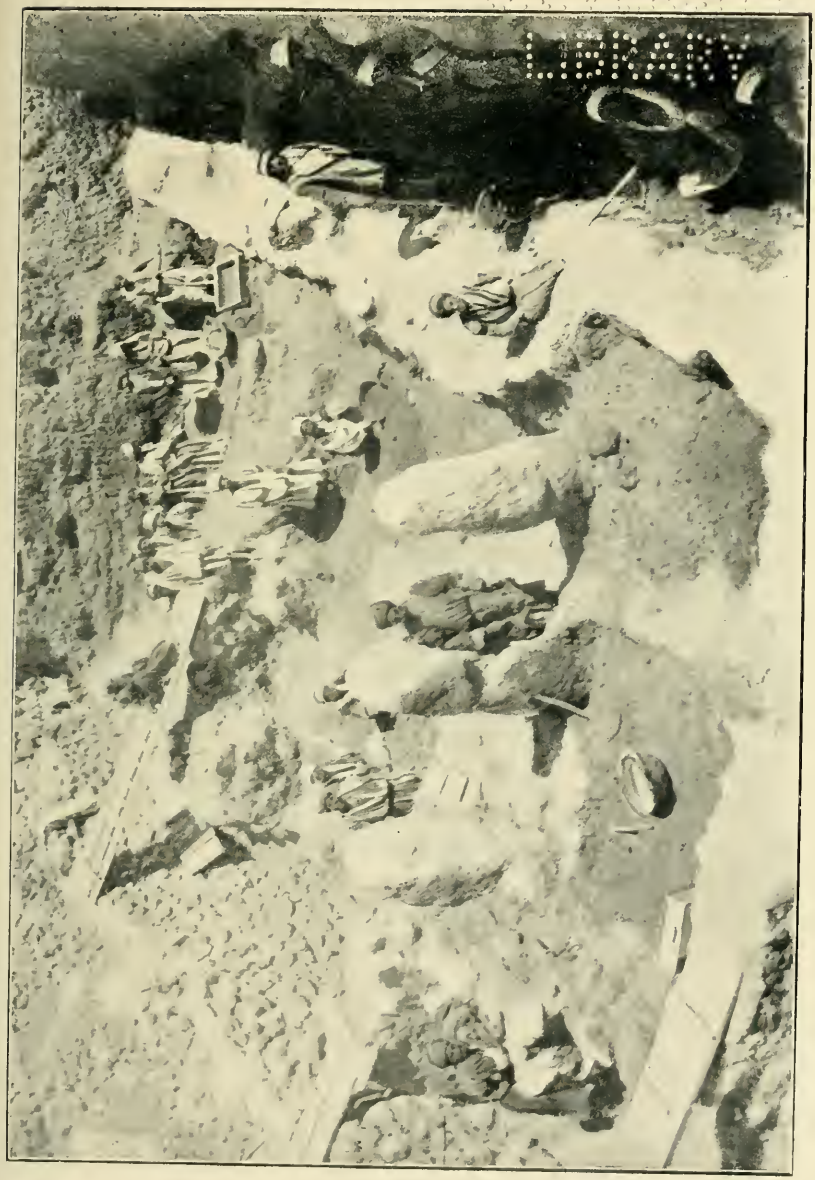
[1] On Plan II the two systems of walls are indicated by a difference in hatching.

roughly pentagonal foot-stone, measuring 24 inches by 20 inches, which stands on a second similar foot-stone, set on *débris ; b* and *c* have but one foot-stone each, that under *b* being roughly rectangular. Between stones *c* and *b* was found a row of rough field-stones, unworn by feet, and above this, separated from it by about 1 foot of *débris*, a second row. Between stones *b* and *a* was another similar row, about 4 inches higher than the lower of the two rows just mentioned. The line of stones continued between *a* and Wall 4, and was found 18 inches lower between Walls 4 and 5. This line appears to indicate a natural ground level, and hence the monoliths rose from 4 feet to 5 feet only above the surface. Signs of rubbing were observed on the exposed surfaces of the monoliths, in one at the height of a man's shoulder above the supposed ground line, in another at the height of the shoulders of a sheep. In the *débris* south of the monoliths, at about the level of the row of stones connecting them was found a quantity of bones of camels, sheep, and cows. A few such bones were found under the foot-stone of *b*.

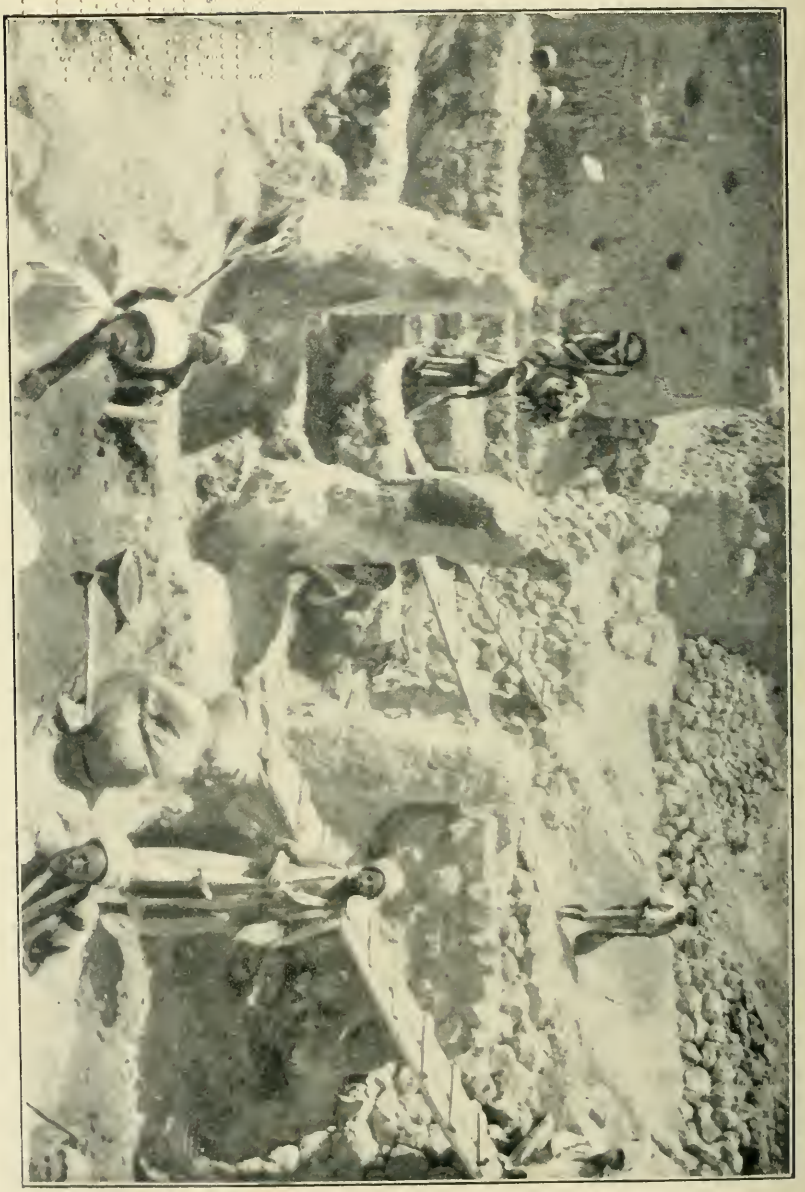
Assuming this row of field-stones to indicate the ground level of the temple, we may look for other signs of ground levels in the surrounding walls. At A we find a doorway with a footworn sill 10½ inches below the line of stones connecting *a* and *b*, but only some 4 inches below the line connecting *c* and *b*. Doorway A leads into the chamber bounded by the walls 1, 2, 3, and 4, which thus appear to have been in use when the monoliths were connected by the rows of field-stones. From the height still standing wall No. 1 appears to have served for the later period as well. In the long wall 6 occurs a skewed opening (B), roughly silled with footworn stones, 1 foot below the line of stones connecting *a* and *b*, and hence only 1½ inches below the sill at A.[1] A similar footworn sill occurs in the doorway C, 8 inches below the sill at B, 9½ inches below the sill at A, and only 20 inches below the line of stones connecting *a* and *b*. These sills are too nearly at the same level to admit of the supposition that they represent different periods, and hence appear to belong to one system of chambers, the flooring

[1] For discussion of the opening B, *see* a later paragraph.

To face p. 320.



VIEW OF SUPPOSED "TEMPLE" FROM THE SOUTH.



VIEW OF SUPPOSED "TEMPLE" FROM THE NORTH.

of which was slightly irregular. Moreover, the walls with which they are connected are either very nearly parallel, or very nearly at right angles to each other. Further examining the walls we find Wall 8 parallel to Wall 6, and terminating at the south in about the same line. In Wall 7 there occurs a break, roughly in the form of an apse, though it has not the symmetry necessarily indicated in a small scale plan. This break is 4 feet 5 inches across and 2 feet 4½ inches deep. At first it was a question whether the break was due to the ruined condition of the wall at this point, or whether it was a part of the design rudely carried out. The fact, however, that no signs of foundations occur at this point is in favour of the latter view, as, had it been a mere breach, the bottom row of stones would probably have remained. This view is strengthened by the position of the break almost midway between the parallel walls, 6 and 8, and, further, by the fact that it faces a rude semicircle of stones, having a diameter of 3 feet 7 inches, which is only 10 inches shorter than the diameter of the supposed apse. This semicircle stands to the height of 20 inches, and consists of two courses of stones. The level of its top is some 4 feet below the line of stones connecting *a* and *b*, hence if it belonged to the same system of construction we must suppose that several courses have been ruined. Its occurrence almost immediately in the centre of the chamber which we are endeavouring to reconstruct is noteworthy. This chamber is bounded on the north by the wall 7, which is broken off a few feet west of the apse, but which probably once ran to Wall 8, as indicated by dotted lines. On the western half of this wall a later wall, slightly thinner, was superimposed; this is omitted from Plan I. The chamber is bounded on the south by Wall 3, and by its evident continuation, Wall 9, which are very nearly parallel to Wall 7. On Plan I we have extended Wall 9 to the west. It is bounded on the east and west by Walls 6 and 8, as far as the line of the monoliths, where the chamber is widened to the east by the breadth of Wall 6, and Wall 4 (which runs behind Wall 6) becomes its eastern boundary. Wall 13 is retained on Plan I, as it appears generally to correspond to Wall 4. The distance between

Walls 6 and 8 is about 32 feet, and between Walls 7 and 9 about 30 feet; hence the chamber appears intended to have been a square, made broader towards the south end.

On Plan II the interior of this chamber may be seen to be crossed by various walls, which appear to belong to later constructions, and which are accordingly omitted from Plan I. The walls 10 were clearly constructed when the monoliths were no longer objects above ground, as they are built around *b* (standing about to the level of the top of this stone) and over the line of stones connecting *b* and *a*. The walls marked 11 enclose small rooms, unconnected by doorways, sufficient proof that they represent the foundations of buildings of a later period ruined down below their ground level. Moreover, these foundations are mainly higher than the ground level of the temple. Wall 12 is omitted from Plan I, first on the ground that it interrupts the symmetry of a building the general lines of which appear to be clear; second, it butts on to the monolith, *c*, entirely obscuring one side of it which was equally weathered with the other side; third, in the north face of this wall a monolith 6 feet 3 inches long is built in sideways as a bottom stone, while projecting from under this face, 6 inches below its foundations, we found the round stone *e* (diameter, 20½ inches), at about the level of the line of stones between *b* and *c*. We have here evidently the foot-stone of a fourth monolith as well as the monolith itself, the latter built into a later wall, probably contemporaneous with Walls 10, which were erected at a period when the standing stones were neglected.

To the north of the large chamber enclosing the standing stones we have signs of a long, narrow chamber connected with the former by door C. Of its north wall (14) only the eastern portion remains, and has built into it at the point where it is ruined a stone vat, 30 inches in diameter, with a broken bottom. The position of this vat appears to be merely accidental, and illustrates the rude nature of the construction. Resting on the remains of this wall and extending beyond it to the west is a later wall (omitted from Plan I), which is probably contemporaneous with Wall 11. To the south of the large chamber are signs of a series of small rooms, bounded on

the south by Wall 1. One such chamber—the one entered by door A—has the lower part of its four walls complete, and, as observed above, is shown by the level of its door-sill to belong to the period of the large central chamber. We are thus reminded of the division of the Greek temple into Naos, pro-Naos, and Opisthodomus, only in this case the space for the pro-Naos is sub-divided.

In regard to the skewed opening at B, the sides are irregular on plan, though fairly plumb, the wall here (No. 6) is ruined down to a level only a couple of feet higher than the rough sill, consisting of irregular footworn stones, the polish extending to a slight bend in the jamb where it is unlikely that a man should step in passing through the supposed doorway. These considerations led me to question the fact whether we had here a doorway at all, or whether this were merely a point where the wall was ruined down to the level of some footworn stones which had been built into this wall, just as the broken vat had been built into Wall 14. However, I am not inclined to be dogmatic on the matter. Mr. Macalister does not recognise this objection, and has advanced the ingenious and plausible theory that the opening was skewed on purpose to admit the rays of the rising sun on a certain day of the year, directly upon the apse in the north wall.

Under the foundations of Wall 6 was found, apparently *in situ*, the irregularly circular stone *d*, 30 inches across, similar to the foot-stones under the monoliths. Its level is about 1 foot lower than that of the foot-stone of *e*. The stone *f* was found *in situ* about 1 foot higher than *d*. It has a rude pentagonal shape, measuring 24 inches across, shows signs of footwear, and is indented with three small sockets, 1 inch across and $\frac{1}{2}$ inch deep. Stones *a*, *b*, and *c* are in a line pointing almost due east (the reading of the prismatic compass is 92 degrees), but taken in connection with the bases, *d*, *e*, and *f*, form part of a rude circle. Now stone *d* is buried by the wall No. 6, hence, assuming a connection between the six stones, it seems probable that the stone circle was an object of veneration before the surrounding temple was built. At that time stone *d* must have disappeared from the system. The fact

that the line of field-stones connecting the monoliths extends between stone *a* and Wall 4, and between Walls 4 and 5, suggested the possibility of finding foot-stones under these two walls. However, no such stones were found, and they probably never existed, as it is improbable that these should have been removed when the walls were built, and that the smaller field-stones should have been left undisturbed. The latter, then, were probably put in place after the walls were built.

At a point 40 feet to the north of stone *b* was found a boulder, *g*, resembling a foot-stone, at a level about 5 feet below the general level of the other foot-stones. On the assumption that the stones above described originally formed a circle, this might possibly be the foot-stone of a monolith, such as is constantly found outside the circumference of such circles elsewhere; as the Friar's Heel at Stonehenge, and Long Meg, in the group known as "Meg and her daughters." The depth at which *g* was found would, of course, make it necessary to assume a much longer monolith than *a*, *b*, and *e*.

Unfortunately the objects found in the large clearance pit were comparatively few, aside from the pottery which we have shown (p. 193, July *Quarterly*), to lie in four strata: (1) From the surface to a depth of 7 feet we found a mixture of styles with a good proportion of Arab ware, the other types consisting of Jewish ware, Greek ware (both early and late), and a few pre-Israelite specimens. (2) From 8 to 10 feet we have the same types, minus the Arab stuff and with less late Greek. (3) From 9 to 20 feet occur pre-Israelite types, including Phœnician forms. (4) From 21 feet to the rock occur only the most ancient forms of pre-Israelite ware (dated at Tell-el-Hesy, 1600-1700 B.C.), with no Phœnician stuff. The temple thus falls into the later pre-Israelite period, as its supposed ground is about 18 feet under the surface.

The painted pre-Israelite pottery shows a great variety of patterns. Only one specimen is now published, though the fragments cover 11 sheets of drawings. This was found at the level of the temple (Plate II). It is a large and fine jar, 27·4 centimetres high, in buff ware, with strainer-spout on the side containing

13 holes. The handle, which was not opposite to the strainer-spout but a quadrant round from it, as well as the rim, is broken off. The ornament, in order from bottom to top, consists, first, of four horizontal red lines; second, a broad band, showing the figure of a bird, spirals, upright lines, and zigzags, all in black; third, three red lines; fourth, a belt, consisting of groups of concentric semicircles in black (necessarily distorted in the projection of the ornament shown in the drawing); and, finally, a red band around the neck. The jar was found broken, but we were able to put the fragments together.[1]

A curious vessel, of a form quite new to me, was found just above the temple (Plate III). It is in the form of a cylindrical cup, 13·8 centimetres in diameter at the mouth and 9 centimetres in height. The sides are concave and the base convex, the foot being broken off. At one point in the side an irregularly triangular hole has been formed in the making. In front of this is one attachment of the handle, now lost; as the rim shows no trace of the other attachment, the handle was never looped upwards, and if looped at all must have joined the lost foot. In the side opposite this hole the wall of the cup is interrupted to admit of a group, consisting of (1) the head and neck of a swan with prominent bill and with bulging eyes—one of these eyes has gone, showing that they were formed separately and fitted into cups made for the purpose; (2) two small rude bird figures, one on each side of the swan (the left being broken off), with shapeless body but with eyes projecting prominently from the head. In front of the swan is a bent pillar, springing from the lower edge formed by the concavity of the side and rising concave to the swan neck; this pillar terminates in a flower-like cup with three petals, between which and the bill of the central figure is a free space of about 1 centimetre.

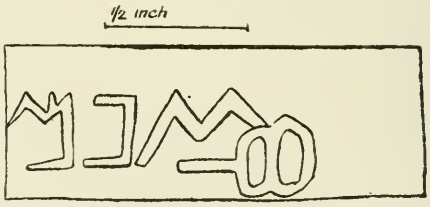
The grotesque figure shown in the cut was found below the temple level. It has a beard and horns, with eyes of

[1] The descriptions of objects here given are taken mainly from the catalogue of finds kept by Mr. Macalister.

cylindrical form. The figure is hollow, the top being cupped like a candlestick. A cast is sent.

Grotesque Head in Pottery from below Site of Supposed "Temple."

The jar-handle with inscription in Samaritan characters was found within a few feet of the surface. It appears to consist of three letters, which we read שׁפט, with a symbol below, like two adjoining circles, often found below the inscriptions on Greek jar-handles.



Inscription in Samaritan Letters Stamped on Jar-handle.

A good many objects were found in stone (including a jar of black marble and a rude mace-head, both below the temple level), iron, bronze, and bone. Only the latter are published at present (Plate IV). No. 1 is an object of unknown use, consisting of a cylinder ending at the top in a semi-spherical head and drilled with a cylindrical hole. No. 2 is similar, but more ornate; it consists of a rosette (not unlike the capital of a column), at the top of which is a U-shaped socket; found at a depth of about 14 feet. No. 3 appears to be an archer's wrist-guard, consisting of a plano-convex strip of bone, pierced with two holes and

ornamented with lines at the extremities. No. 4 is a spindle-whorl of ordinary type, with ornamentation. No. 5 appears to be part of a bracket, with two holes for fastening; it was found at a depth of 18 feet. No. 6 may be a pendant, ornamented. No. 7 is an object of unknown use, consisting of the half of a long bone, split longitudinally, sawn off smooth at the ends, and ornamented with chevron pattern. No. 8 is a fragment of a cup on two stands, only one of which remains; the rim is ornamented with chevron pattern in relief. No. 9 is highly polished and pierced with three holes. The interesting object, No. 10, was found in a trial shaft on a part of the north-east plateau, not yet fully excavated, at a depth of some 12 feet. It is a vessel 17 centimetres long, 3·6 centimetres high, and 7·4 centimetres in extreme breadth. It appears to be an incense boat. The vessel was found complete, and the cover in fragments, one of which was missing. The cover fits on to a depression in the top of the boat, and was intended to turn on a pivot which once ran through the two corresponding holes marked A. Of the drawings, *a* represents a side view of the boat, with cover *in situ*; *b* shows the cover; *c* represents the top of the vessel (cover removed); and *d* the bottom, showing the ring-base. On the theory that this is an incense boat the perforations in the cover are for letting the incense through. The perforations at the two ends of the vessel itself are apparently the stands for some further covering portion, now lost.

Scarabs 1–4 (Plate VI) were from this large clearance, No. 4 being found at the level of the temple. The bone figure of Phœnician type (Plate V, No. 1), the monkey, in green paste (Plate V, No. 2), and the rude cylinder (Plate VI, No. 12), were all found at the level of the top of the standing stones.

On p. 197 of the last report we referred in general to a quantity of miscellaneous objects cast on to a rubbish heap covering the ruined ancient city wall. We now give a catalogue of these objects, which, though mingled together, represent many periods and civilisations.

A. *Pottery.*—(1) Various fragments of vases, including black and red polished Greek ware (550–350 B.C.), early Greek

ware (550–750 B.C.), Jewish and Phœnician types, the latter including the inscribed jar-handle described in the last *Quarterly*, as well as another jar-handle stamped with a figure hunting a stag.

(2) Over 100 fragments representing at least 40 different masks, falling into three types:—(*a*) Female heads, with hair braided under head-dress, having circular ear-drops in the ears. Features of Græco-Phœnician type (*see* photograph). Top of head arched and brought to smooth surface for suspending, with hole for same. In some cases we find traces of ornamental colouring in red. Height when complete about 23 centimetres. Masks in pottery and stone are not unknown in Palestine; in an interesting note in the *Quarterly Statement* for 1894, p. 209, the Rev. J. E. Hanauer connects these with the *oscilla* or "little faces" of Bacchus, suspended in the vineyards (Virgil, Georg., ii, 388–392). (*b*) One very rude fragment, possibly a male. (*c*) Several fragments resembling type (*a*), but much smaller, and having, as a rule, a serrated edge.

(3) Fragments of convex plaques (convex behind) showing the foreparts of female figures, in one case to the knees, with details of arms, breasts, drapery, &c. These are of the same character as the face-masks, being merely prolongations of the same.

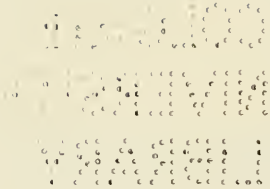
(4) Twelve small heads, including fine female head with classic features, head of Silenus, archaic Greek head of warrior with helmet; these three have been cast.

(5) About a dozen fragments of a seated female figure, very badly moulded, so that the features, arms, &c., are indistinct. The most perfect specimen (of which a cast has been made) is broken off below the knees; present height, 14 centimetres. The figure is nude; one arm is bent, with the hand resting upon the abdomen, the prominence of which indicates pregnancy; the other hand rests on the knee; the head-dress is in the Egyptian form, with veil falling over the shoulders. The figure is hollow, the back being unworked, and almost flat.

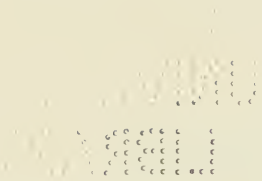
(6) Three fragments of hollow male figures of the same type, but varying in fineness of execution. These are shown in the accompanying photograph. The best moulded is the central

[*To face p.* 328.

Three Pottery Figures resembling Jews, holding their Beards.



EXAMPLES OF FRAGMENTS OF POTTERY MASKS.



[*To face p.* 328.

STONE HEADS.

figure, which has a long beard, the end of which is clasped by the right hand. On the head is a round flat cap, from under which a veil falls on the shoulders. The hair is braided, and the features have a marked Semitic cast. The back of the figure is unworked, and the fragment preserved does not indicate whether the figure was seated or not. Present height, 11·8 centimetres. A cast has been taken. The figure to the left is seated; the right hand clasps the beard. The cap is pointed, having a knob at the top and side lapels. The figure to the right is very faintly moulded and badly proportioned, but the rough indication of a hand clasping the beard relegates it to the same type with the figures just mentioned.

(7) A plaque with rude figure of Pan, with hoof and horns, painted vermilion; height, 10·5 centimetres.

(8) Three badly-moulded figures of a horse's head, with rider behind, indicated only in outline. (Cast.)

(9) Two hollow female figures, with heads gone in both cases; heights, 17 and 21 centimetres respectively. The type appears to be Græco-Phœnician. In the first, the right hand is broken off, and the left arm is bent so that the hand rests on the body between the navel and the breasts. In the second, both arms are broken off at the elbows; around the neck has been a high collar, of which traces remain.

(10) A rude head which appears to be of the Mycenæan type. (Cast.)

(11) A badly moulded figure of woman, draped from waist downwards, with undraped child on shoulder. (Cast.)

(12) Three small fragments of figures, one showing hand clasping breast. The second with hand holding asp to breast. (Cast.) The third with hand holding asp to thigh. (Cast.)

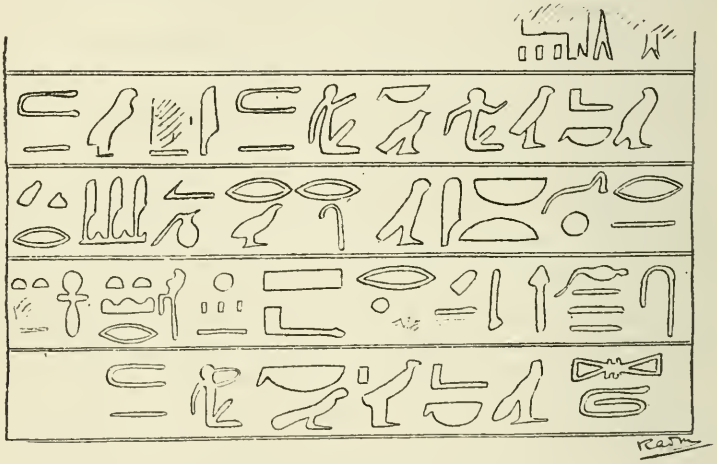
(13) Small fragment showing two figures wrestling.

(14) Small fragment; middle of a figure wearing ægis, with Gorgon head. (Cast.)

(15) A bit of clay, stamped with seal. (Cast.)

B. *Stone Statuettes.*—A large number of fragments of statuettes were found, carved in chalky limestone. The style of art is rude, and the details of ornament are better worked out than the features, arms, hands, &c. Six heads turned up,

five of which are shown in the photograph. All appear to be female. Counting from the left, the first wears a pointed cap, with lapels hanging down on either side; the hair is braided under the cap; the nose is broken off. The second has a ring of vermilion colouring about the neck, with head-dress of beads above the roughly indicated hair. The features of the third head are almost entirely worn away. The fourth was plainly part of a corbel; present height, 11·1 centimetres. The nose is broken, but the other features are distinct. The head-dress consists of a lion's head, with lapels hanging down and cut about the ears. A cast has been sent. The fifth has braided

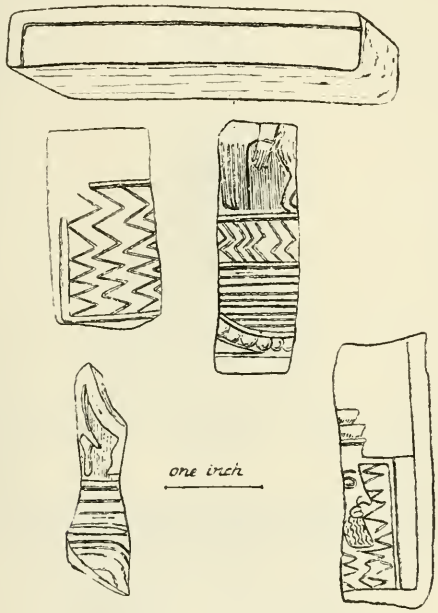


Inscription on Ushabti Figure.

hair, with coronet above, and shows traces of crimson colouring on neck and hair. The nose is gone, and the other features are badly formed. Among the other fragments are headless busts, clothed in tunics, usually tightly fitting, and in some cases extending to the feet, with roughly executed lines of drapery. On one example, of which a cast is sent, the drapery is much more graceful, showing the contour of the breast, &c. This specimen has a beautiful necklace, with pear-shaped pendants. Besides these were several fragments of hands, feet, &c., &c.

C. *Egyptian Objects.*—(1) Twelve paste charms in the forms of eyes Utchats) of various forms and colours (Plate V, No. 10),

(2) Two figures of Bes in blue paste, about 3·6 centimetres long (Plate V, 5); one minute figure of Bes in green paste; one green paste head of Bes, with black eyes and head-dress of green and black feathers (Plate V, 16); a smaller head of Bes, same type, blue paste (Plate V, 25); and a full figure of Bes, green paste, with similar head-dress (No. 25). (3) Seated female figure of black-brown paste, slightly fractured at lap, which appears to have borne a child. Perhaps Isis and

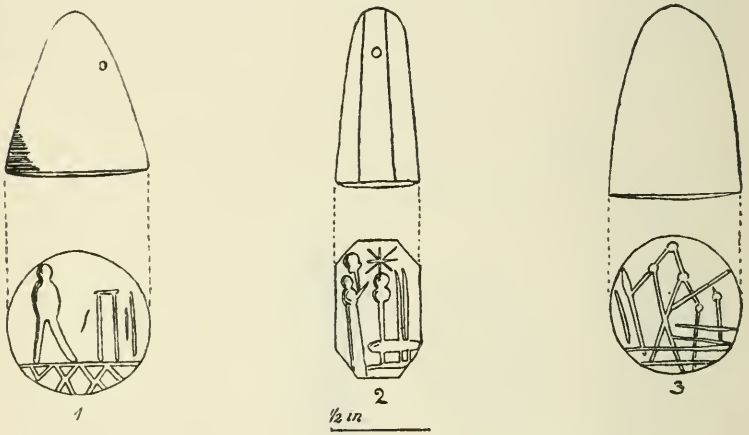


FRAGMENTS OF AN ASSYRIAN STELE.

Horus (18); cast. (4) One lion's head (cast). (5) Three broken figures of Sekhet (No. 22). (6) Six minute paste amulets. (7) Bone scarab on bronze holder (Plate VI, 8), and blue paste scarab (Plate VI, 6). (8) Bronze statuette of Sekhet (Plate V, 13) on tenon for mounting, with uræus, broken off. (9) Lower half of Ushabti figure; green paste (*see* cut).

D. *Babylonian and Assyrian Objects.*—(1) One green glass seal, scaraboid form, with figure of man (Plate VI, 7); one blue glass seal of similar shape, showing man on horseback fighting

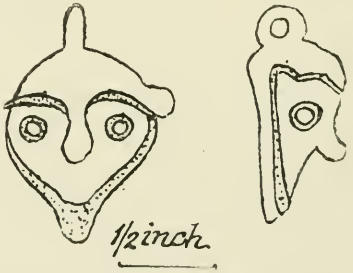
lion (No. 10). Similar seal of fine white stone, showing warrior with outstretched arms (No. 9). Scaraboid showing horse, jade (No. 11). (2) Five fragments of a limestone slab with Assyrian figures and markings. (3) Four seals, three of which are shown in the cut. No. 1 is of dark reddish stone; 2 and



STONE SEALS.

3 are of agate: Nos. 1 and 2 show priest at altar. The fourth is of greyish stone, and shows faint markings. Impressions of all are sent.

E. *Phœnician Objects.*—Three grotesque amulets of blue glass with yellow edges, showing a head with prominent ears.



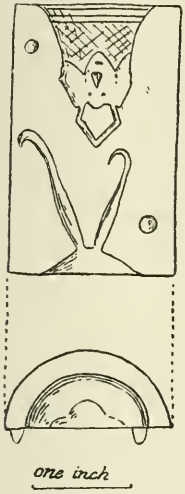
GROTESQUE AMULET IN BLUE AND YELLOW GLASS.

One is whole, the other two have each lost an ear. A cut is given. Two fragments of similar objects were found—one

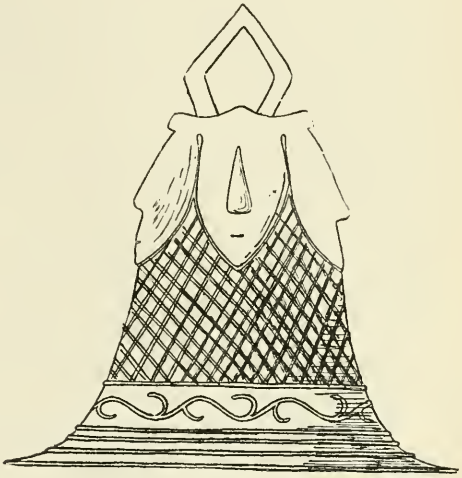
black with white edges. Of the same type was a grotesque seated figure, obscene in character, of which a cast is sent.

F. *Over* 300 *Beads* in carnelian, agate, coral, blue paste, blue and white paste spotted, amythest, &c., &c. Many shapes and sizes, a few of which are shown on Plate V (Nos. 12 and 15).

G. *Miscellaneous.*—Two wooden objects of unknown use (Plate V, 17); one small pear-shaped weight; a stone mould



Mould for Casting Bell.



Enlarged Sketch of Bell.

for casting a small bell, including the clappers (*see* cut). A cast has been taken and shows the bell to be ornamented with heads in relief. The bone objects, Nos. 7 and 9, Plate IV, were also found in this rubbish heap.

Jerusalem, 4*th September*, 1899.

A VISIT TO TELL ZAKARÎYA.

By Major-General Sir Charles W. Wilson, K.C.B., F.R.S., R.E.

On the 24th March last I left Jerusalem to visit the excavations at Tell Zakarîya, and travelled by the Jerusalem-Jaffa Railway as far as the Deir Abân Station. After crossing the "Plain of Rephaim" the line enters the Wâdy el-Werd ("Valley of Roses"), and then, in its rapid descent, follows all the windings of the deeply-cut valley known as Wâdy Ism'aîn and Wâdy es-Sŭrâr. The train stops for a few moments beneath Bittîr and the stronghold which Bar Cochba and the insurgent Jews held for three and a half years against the might of Rome; then it runs on through the ever-deepening ravine. The scenery is wild and picturesque. On either side the hills of blue-grey limestone rise abruptly. Here and there are olive trees or low brushwood. In the valley-bed there is rich red earth that has been washed down by the rains, and high above is a brilliant sky of deepest blue.

As the train approaches the mouth of the gorge, a cavern high up in the rock to the right is pointed out as the trysting-place of Samson and Delilah; and as it leaves the hill-country of Judah it enters that part of the Shefelah ("Lowland") which is so closely connected with the stormy life of Samson. Here the Wâdy Sŭrâr rapidly expands into a broad, fertile valley bordered by low hills. On the left, a little east of Deir Abân Station, it is joined by Wâdy en-Najîl, in which lies the village of Deir Abân (Ebenezer). On the right, separated by that part of Wâdy el-Mutluk which has been identified with Mahaneh Dan, are 'Artûf, now occupied by a colony of Roumanian Jews, and Sŭr'ah (Zorah) with its little white-washed tomb. Higher up the valley, but hidden by the spur on which 'Artûf stands, is Eshû'a (Eshtaol).

At Deir Abân Station I was met by one of Dr. Bliss's men, who acted as guide. For a short distance we rode westward through a grove of old olive trees, and had in front of us the

broad valley Wâdy Sŭrâr (Valley of Sorek), up which the untended oxen brought the ark from the land of the Philistines. It was now covered with wheat and barley, and looked like a bright green carpet spread at the foot of the grey hills to the north. Soon we turned southward, and, after a slight ascent, passed between 'Ain Shems (Beth-shemesh)—a site that should be excavated—and the tomb of Neby Shamshûn. Here we came in full view of the Latin Hospice and Orphanage at Beit el-Jemâl, which stands in a conspicuous position on the top of an olive-clad hill. The land was purchased by the Marquis of Bute, and given by him to Don Belloni for the construction of an Agricultural School in connection with the orphanage of the latter at Bethlehem. In 1892 Don Belloni transferred the Orphanage and School to a religious society founded by Don Bosco at Turin, and under its auspices the work is now carried on. There are at present at Beit el-Jemâl priests, lay brothers, and sisters belonging to the Society, and about 30 orphans in the school.

From 'Ain Shems the way led across the bed of Wâdy en-Nahîr, in which were pools of stagnant water, and up one of its branches—a long valley between low rounded hills capped with grey limestone. At first the valley and the slopes of the hills were covered with young wheat and barley, in the midst of which stood a few olive trees; but higher up, near Biyar, there was much swampy water and an abundance of grass. Here the hillsides were gay with anemone, cyclamen, and other flowers, growing amidst the low, green brushwood. Near the head of the valley we turned to the right, and, after a short climb, looked down upon Wâdy es-Sŭnt (the Valley of Elah), with the village of Zakarîya on its right bank, and Dr. Bliss's camp in an olive grove, at the foot of Tell Zakarîya, on its left bank. Descending by a rough path we passed through the village, which is built of mud and stone, and contains nothing of interest, and came to *Bîr es-Siflâni*, a well in the valley with a never failing supply of water. A little farther was the camp with the Turkish flag flying over the tent of Shauket Bey, the Commissioner, to whose tact and influence amongst the *fellahîn* the Fund is so much indebted.

Tell Zakarîya rises about 350 feet above the bed of the valley. It is a natural fortress commanding one of the approaches to the hill country of Judah, and its appearance, when seen from a distance, is almost as striking as that of Tell es-Sâfi, which stands on the skirt of the Shefelah like an outpost overlooking the plain of Philistia. A steep climb by a path which passes some rock-hewn chambers leads to the top of the Tell upon which the ancient town[1] stood. The surface is fairly level, except on the south, where higher ground marks the position of the Acropolis, and it was here that work was going on. Dr. Bliss had already traced the walls, and the workmen were clearing out one of the sections into which the enclosed area had been divided. The rock had been reached and a few rock-hewn steps had been found leading down to a small cave that had not at that time been completely explored. The extent of the excavation is shown in Plate I.

I went round the excavations and visited some of the rock-hewn chambers with Dr. Bliss and Mr. Macalister, who have fully described their investigations in the *Quarterly Statement*. The walls of the Acropolis show every sign of having been several times rebuilt, and the towers apparently belong to one of the later reconstructions. In no instance is the character of the masonry so distinctive as to fix its date even approximately. I have ventured to suggest a Maccabean origin for the later masonry from its resemblance to that of the buildings at Machaerus, but this is a mere supposition. All that can be said is that the Tell was occupied at a very early, pre-Israelite, period, and that it was probably deserted soon after the Roman occupation. It is impossible to say when or by whom any particular restoration was made.

The inscribed jar-handles, the scarabs, the cylinders, and other small objects that have been found are of great interest: and not less so, in their way, are the rock-hewn chambers which have been examined and planned by Mr. Macalister since my visit. Somewhat similar chambers are found in other localities in Palestine, and their arrangement seems to

[1] Possibly Azekah, *see* Smith's "Dictionary of the Bible," 2nd edition, on that place.

[To face p. 336.

PLATE I.

Excavation in the Acropolis at Tell Zakarîya.

PLATE II.

Tell es-Sâfi from the East.

indicate that they were used as places of refuge in times of danger. A possible allusion to such retreats is perhaps contained in the Bible reference to the condition of the Israelites before Saul's victory at Michmash. The view from the top of the Tell is extensive and interesting, especially towards the east. The battlefield on which David slew Goliath is plainly visible near the foot of the hills, and the route followed by the Philistines in their rapid flight can be clearly traced.

In the evening I was present at the payment of the *fellahîn* for the pottery and other objects they had found during the day's work. Each *fellah* produced his "find," and on handing it over to Dr. Bliss received a small sum, with which he appeared well satisfied. The system of giving every man who finds something a small money payment in addition to his pay is an excellent one, and beneficial both to the Fund and the *fellah*. I may add that the relations between Dr. Bliss and Mr. Macalister and the *fellahîn* from Zakarîya were evidently excellent—a sure proof of their tact and unfailing good temper in dealing with the native workmen.

On the 25th I rode with Dr. Bliss to Tell es-Sâfi. Our way lay down Wâdy es-Sŭnt, a fertile valley in which the villagers were ploughing preparatory to sowing their *dura*. We had a good view of the Tell as we approached it from the east (Plate II). It lies approximately north and south, and at either end the ground rises, leaving a hollow in the centre in which a part of the village lies. A steep ascent led to the top of the Tell, where we found that the ground available for excavation was limited. At both the north and south ends there are cemeteries, and at the latter a *Makam;* but we noticed several fields and small enclosures which were either under cultivation, or had not been used as burial places. There are a few remains of the castle, Blanche Garde, built by King Fulke in 1144; and the line of the old city wall was clearly marked by a terrace running round the hill. In these clear spaces it was decided that Dr. Bliss should commence digging, and the interesting results which he obtained are in course of publication in the *Quarterly Statement*. There are many caves,

tombs, cisterns, granaries, and other chambers hewn in the soft white rock which will probably repay examination.

Tell es-Sâfi, standing above the broad valley, Wâdy es-Sŭnt, at the point where the lowland gives place to the plain, protected by its white cliffs, and connected at one point only with the low hills to the south, is a position of great natural strength. It must have been occupied at a very remote period, and have been one of the principal strongholds of the country long before the appearance of the Israelites and the Philistines. The difficulties, arising from the position of the village and the cemeteries, that prevent a thorough examination of the site are consequently most unfortunate.

After completing our examination of the Tell I parted from Dr. Bliss, and rode over the last outlying spurs of the Shefelah to the railway station at Sejed. The district through which I passed is well adapted to the growth of the olive, and was no doubt formerly covered with olive trees. Nothing is now to be seen but low shrubs and brushwood with a few small olive groves near the villages. During the whole of my ride from Deir Abân to Sejed, I saw nothing but old olive trees; there were no new grafts, and there was no attempt to replace the aged trees that had only a few years' fruitful life before them. This is due to the crushing taxation on the trees, which is more than they can bear in ordinary years, and leaves little to the proprietor in prosperous seasons. In some cases it is said the *fellahîn* were cutting down the old trees to avoid taxation.

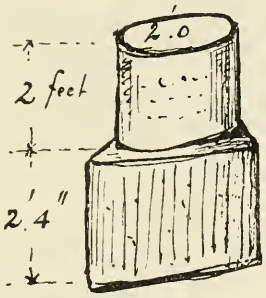
At Sejed, where H.I.M. the Sultan has a large farm, I took the afternoon train to Jerusalem.

REPORTS FROM GALILEE.

By Dr. G. Schumacher.

Syria Ottoman Railway Company.—The works of this important undertaking have been resumed, after nearly a four years' pause, by A. F. Hills, Esq., of the Thames Ironworks and Shipbuilding Company, London. Up to this date 24 kilometres of earthworks have been completed in the plains of the Kishon and Esdraelon, and 8 kilometres of rails are laid.

At kilometre 14·490 from Haifa we struck the spring 'Ain el Ghŭfr, situate three-quarters of a mile south of the village of el Hârithîyeh, at the foot of Tell el 'Aly, on the main road leading from Acca to Jenîn and Nâblus. Close to the north of this spring and on the western edge of the high road we discovered an ancient

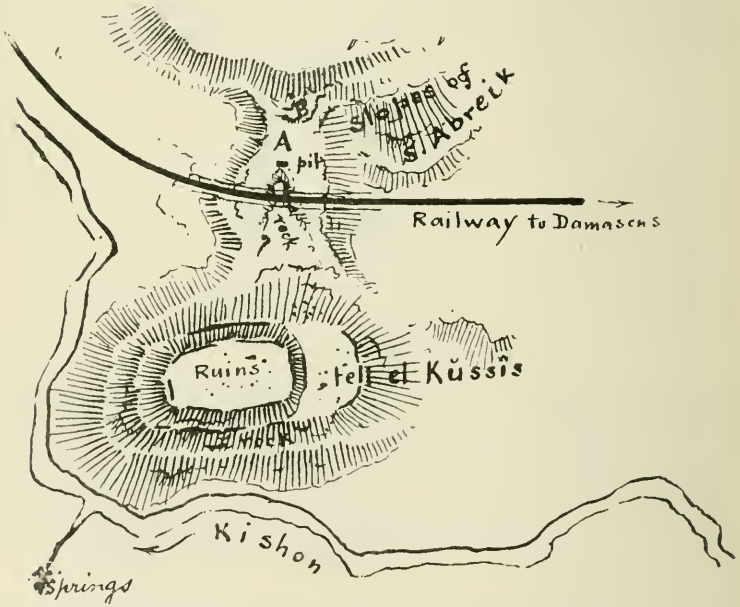


monolith of limestone partly buried in the ground, probably a Roman milestone or a boundary mark; the top part consists of an oval shaped shaft, 2 feet in diameter, and the square base measures 2 feet 4 inches in height. On the shaft we can yet trace something like an inscription, but owing to the softness of the stone it is so entirely illegible that I could not make out any of the characters.

'Ain el Ghŭfr means the "Spring of the Guard." Was there a watch tower on this probable boundary of Harosheth—Hârithîyeh? The spring marked 'Ain el Ghŭfr on Sheet V of the large Palestine Exploration Fund map, west of the village, is generally called 'Ain el Hârithîyeh.

At kilometre 17·400 to 17·900 (from Haifa) we have a cutting through the neck connecting Tell el Kŭssîs with the south-western

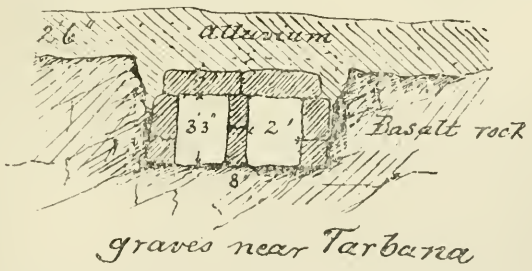
slopes of Sheikh Abreik. The cutting has a maximum depth of 17 feet, and shows on the top a thin layer of humus (earth) of 1 to 3 feet thickness, followed by white clay, which gradually subsides into crumbling Meleki limestone, in which perfectly circular nodula, from 3 to 18 inches diameter, are found. No traces of ruins have been discovered, although the cutting is only 200 yards distant from the ancient site of Tell el Kŭssîs. This Tell shows on its surface an extraordinarily large number of fragments of ancient pottery strewed about, and a wall can be traced around the edge of the small plateau; two Eyubite, Arab copper coins, were collected from among the *débris*. Proceeding northward 16 yards from the present cutting the trial pit, A, struck no rock to a depth of 15 feet, whereas 30 yards further north near B, the rock is again visible on the surface of the earth; it occurred to me,



therefore, that a line drawn through pit A may mark an old bed of the Kishon River, leaving Tell el Kussîs south instead of north of its course. The strata of the rock near B and in the cutting are very steep, the beds of the limestone are contorted and irregular. The shrine of Sheikh Abreik [or Bureik] بريق is still highly venerated by the Bedawîn of the Merj ibn 'Âmir. According to

their tradition the Sheikh lived previously to the Prophet; it is a fact, that if you take an oath from a Bedawy, and make him swear by Sheikh Abreik, he will not deceive you. Does Bureik allude to the history of Barak and Sisera and Deborah, which developed between Debûrieh on the foot of Mount Tabor and Hârithîyeh or Harosheth of the Gentiles (Judges iv), or may we venture to find the Hebrew form for lightning (Barak, בָּרָק), in the Arabic Bureik, بريق; and would this allude to Elijah's sacrifice on the near summit of Mount Carmel and the slaughter of the Baal priests near Tell el Kŭssîs, "the Mount of the Priest"? Bureik is the diminutive of *barḳ*, برق, lightning. In this connection I may also state that I could not arrive at any local tradition as to the origin of the name Merj ibn 'Âmir, مرج ابن عامر, "meadow, plain of the son of 'Âmir," for the plain of Esdraelon, unless it alludes to "Ahab the son of Omri" (1 Kings xvi, 29).

Between kilometres 31·071 and 31·840 the railway cuts through a spur in the plain called Tell en Nahla, نحلة, 3½ miles south of the village el-Mujeidil, and 3 miles north-west of el 'Afûleh, close to the ruins and springs of Tarbaneh. In this cutting we struck a considerable number of human bones and graves. The surface of Tell en Nahla is a reddish brown, rich soil, varying from 2 feet to 3 feet in depth, deposited on *basalt* rock. This basalt is on its surface crumbling, and can be worked to a depth of 23 feet with a pickaxe; the volcanic mass contains quantities of volcanic sand and is rich in silicates. On the slope facing the ruin of Tarbaneh we found, in a depth of 2 feet 6 inches



Graves near Tarbana

to 3 feet, single and twin graves cut out of the rock and built up in limestone (nâri) masonry. The grave chambers have a width of 2 feet, a height of up to 3 feet 3 inches, and are 5 feet 10 inches

long. The twin graves have a stone wall 8 inches thick between the chambers; they are generally not oriented, most of them run north-south, some S.E.-N.W. In the interior were found fragments of Roman pottery, glass and lachrimatories, iron nails, pieces of lead and crushed lead cups with little or no ornaments, one copper coffee spoon, and in one grave a copper Hadrian coin, of which I enclose an impression. The bones that lay scattered or in heaps 2 feet below the surface may be of much later origin than the actual graves, in which no bones were found. The bones I consider to be of Arabian origin, probably of the time of the Napoleon battle at Fûleh (1799); the graves, to judge from the Hadrian coin, date back as far as the second Christian century.

It was an unexpected discovery to find lava on the Tell en Nahla, therefore I carefully traced the volcanic region as far as it occurs in the plain of Esdraelon. Following the northern border of the plain, we first discover a lava bed of dolerite at the foot of Semûnieh, near 'Ain el 'Aleik, and following the old Nazareth road we here and there perceive isolated basalt blocks; continuing

Copper Spoon from Tell en Nahla (half size).

towards Mujeidel we cross a depression half-way between Mujeidel and Mălûl, in the bed of which the dark dolerite stones occur. Approaching the springs of Tarbaneh, few of the ancient building stones consist of lava, but the whole hill to the west is composed of it as above described. The lava region begins on the east end of the plain between Zer'în and Sôlam, on the edge of Wady Hŭfiyîr, near the 'Ayûn eth Th'aleb, and continues down the Jâlûd plain to Beisân and the first Jordan terrace. Taking the southern border of the plain of Esdraelon we noticed no traces of lava until we reached the village of Abu Shûsheh on the high road Jenîn-Haifa, and near and in the adjacent Wâd el Kusab compact lava masses occur on the surface of the ground. In following the course of the Kishon River I discovered in its bed and slopes, from Tell Thôrah eastwards to across Ludd, basaltic *débris* and volcanic sands. It therefore seems evident that the central part of the Merj ibn 'Âmir was filled up by a lava stream which may have spread across the entire width of the plain, and

may be the consequence of a local outburst or upheaval, as I cannot trace any distinct volcano near Semûnieh, or anywhere near the borders of said plain.

A trial pit 10 feet deep, sunk into the elevated ground, 900 yards north of the village Warakâny (west of Tarbaneh), shows 8 feet of reddish-brown humus, and 2 feet of soft limestone, same as in the Tell el Kŭssîs cutting.

The cuttings and banks of the railway at kilometres 48 and 50 near Shutta are worked in basaltic formation. At Beisân we built dwellings for the engineer's staff, but no discoveries have been made yet at this important site. The heat is very intense already, and we have many cases of fever in the plains.

Haifa, *June 5th*, 1899.

NOTES ON THE ANTIQUITIES OF THE BOOKS OF SAMUEL.

By Colonel C. R. Conder, LL.D.

Ramathaim Zophim.—It has been supposed that the native place of Samuel was not the same as Ramah of Benjamin mentioned as his home (1 Samuel ii, 11 ; vii, 17), because it was in "Mount Ephraim." But Bethel and Ramah, though in Benjamin, were in Mount Ephraim (Judges iv, 5), a term perhaps extended beyond the tribe border—the lot of Benjamin having been taken out of country conquered originally by Ephraim (*see* Joshua xviii, 5, 11). The term Ramathaim Zophim means "People of Ramah of the family of Zuph." Samuel was of the tribe of Levi (1 Chron. vi, 26), and Zuph a Levite of Mount Ephraim (an Ephrathite being an Ephraimite, *see* Judges xii, 5). There is, therefore, no reason to doubt that Samuel's home was Ramah.

Ahimelech, or Ahiah.—In the margin of the A.V. (1 Sam. xxi, 1, and xiv, 3) these priests are identified, but as there was a lapse of time between the two events they may have been brothers. It is remarkable, however, that if the name was written in Cuneiform it could have been read either way.

Stone Ezel.—This was near Gibeah (1 Sam. xx, 19), and apparently means "stone of departure," or "of starting." As Gibeah was a priestly city it is conceivable that this stone marked the Levitical boundary (Num. xxxv, 4), whence the Sabbath day's journey was measured, as it still is by the Jews of Safed.

Cherethites.—It has been proposed to render Cherethites and Pelethites "executioners and couriers" ; but it is clear that the first of these words,

at least, is sometimes topographical. In the Amalekite raid (1 Sam. xxx, 14) against Philistia and the south of Judah (verse 16) the Cherethites are mentioned geographically, and with the Pelethites they are joined to the Gittites, or men of Gath, in another passage (2 Sam. xv, 18). As mentioned in "The Memoirs" of the Survey, vol. iii, 260,[1] and elsewhere, the Cherethites were probably inhabitants of *Keratiya*, in Philistia (*see* Ezek. xxv, 16; Zeph. ii, 5), west of Gath. Peleth was a Hebrew name (1 Chron. ii, 33) belonging to one of the families of Judah, and the Pelethites may have been his descendants. It is not necessary to suppose that either the Cherethites or the Gittites, who followed David, were Philistines, because they lived, like David himself, in Philistia. It is highly improbable that Obed Edom, the Gittite (2 Sam. vi, 11), in whose house the Ark was left, would have been a Philistine. Ittai, the Gittite, was a "stranger" (2 Sam. xv, 19) in Judah, but David's guards are not likely to have been Philistines.

Ammah and Giah.—These names occur on the "way of the wilderness of Gibeon" (2 Sam. ii, 24), or "on the desert-Gibeon road," and immediately after we find the defeated Abner crossing the Jordan Valley (verse 29, *'Arabah*, A.V. "plain"), while the site of the hill in question was within a day's journey of Gibeon (verse 24). The exact rendering of the Hebrew may perhaps be somewhat altered—

עד גבעת אם ה אשר על פני גיח דרך מדבר גבעון

"To the hill Amm ha-Asher facing the fountain (*Giah*) on the road between the desert and Gibeon."

The term *Amm ha-Asher*, "Mother of the upright," might refer to a vertical cliff. If we trace the main road from Gibeon eastwards to the Jordan Valley north of Jericho, we arrive at the cliff called *Umm Sîreh*, which is a possible corruption from Amm ha-Asher. This cliff looks down on the desert and on the fountain of *'Ain Dûk*, the most remarkable spring near Jericho, which is just below. The distance from Gibeon is under 15 miles, and the whole of the conditions thus seem to be met.

The Bamoth.[2]—These "high places," as they are called in the A.V., were local shrines, where sacrifices were offered contrary to the law. The word *Bamah* seems to mean a "monumental stone," and is used in this sense on the Moabite Stone inscription. The origin of the Bamoth is sometimes recorded at various places. That at Shechem (Joshua xxiv, 26), which had a "great stone," may have been the site of Abraham's altar (Gen. xii, 9, 10), and its oak the same as Jacob's oak at Shechem (Gen. xxxiii, 19; xxxv, 4). At Bethel also was Abraham's altar (Gen. xii, 8; xiii, 4) and Jacob's stone (Gen. xxviii, 18). At Mizpeh, in Gilead, was Jacob's stone (Gen. xxxi, 45), probably at *Sûf*, still remarkable for

[1] This identification had not, I believe, been proposed by any other writer before I suggested it, though the site was shown on earlier maps.

[2] The Assyrian *Bamatu* signifies something "upright"; and the sign (*ZAK* in Akkadian) means also a "shrine," "heap," "building," "memorial."

its rude stone monuments. At Gilgal were the twelve stones: at Beth-shemesh (1 Sam. vi, 18) was a great stone on which the Ark was set, and if Kirjath Jearim be the unnamed city of Samuel (1 Sam. ix, 13), there was again a *bamah* where the Ark was kept. At Mizpeh of Benjamin was another stone (1 Sam. vii, 12), and at Gibeah of Benjamin was a *bamah* (x, 5). The great *bamah* was that of Gibeon (1 Kings iii, 4) with an altar, and there was an altar at Ramah of Benjamin (1 Sam. vii, 17), and a sacred place on Olivet (2 Sam. xv, 32). It is noticeable that many of these sacred centres were Levitical cities (Joshua xxi), such as Bethshemesh, Gibeon, Gibeah, and Shechem; while others, such as Bethel, Gilgal, and Kirjath Jearim, were places where the Ark had stayed. Probably the word *bamah* refers to a monument at such sites, rather than a natural "height," since some of the sites were in low ground—especially Gilgal and Bethshemesh.

Nob.—The site of this "city of the priests" is not known, but it cannot have been very far from Gibeon (Isaiah x, 32). It is not noticed in the topography of the Book of Joshua, but it existed after the Captivity (Neh. xi, 32), where it is named between Anathoth and Ananiah (*Beit Hanîna*, near Gibeon). It may, perhaps, have been little more than a priest's settlement (1 Sam. xxi, 1; xxii, 9, 19) close to Gibeon, which was a Levites' city, and specially a priests' city (Joshua xxi, 17, 19). A site such as *Bîr Nebâla* would be suitable, since it is not necessary that Nob should be within sight of Jerusalem. Nob not being noticed in the Book of Joshua, or in any monumental list of towns, but existing from the time of Isaiah to that of Nehemiah, we may suppose that the list in Joshua must be earlier than 700 B.C.; but perhaps later than the time when Saul destroyed the town about 1050 B.C., unless it is to be placed yet earlier, before Nob became the sacred centre with its table of shewbread, and Ephod, and probably also at times the resting-place of the Ark when not taken out to war (*see* 1 Sam. xiv, 18). Nob would have been built after the desertion of Shiloh, and according to a later account (2 Chron. i, 6) the "tent of meeting," or tabernacle, was kept at Gibeon, perhaps after Nob was destroyed. The massacre at Gibeon (2 Sam. xxi, 1) is not noticed in the history of Saul himself, but might have occurred at the time of the massacre of the priests at Nob. There seems, therefore, to be a close connection between the two priestly cities, Gibeon and Nob. Neither of these were priests' cities after the Captivity. In the same connection we may note that David found Goliath's sword at Nob (1 Sam. xxi, 9), but in another passage we read that he took Goliath's head to Jerusalem and put his weapons (כלין) "in his tent" (xvii, 54). In Saul's time Jerusalem was not in possession of the Hebrews as far as we know, and what tent can be intended is not clear. It could hardly be Goliath's tent, even if David knew where that was, or if he had one at all, for the spoil would then have been taken with the rest (*see* verse 53); nor had David a tent of his own. The reference must be to a later period, after David took Jerusalem; but it may be objected that the giant's head might not be preserved. We may, however,

remember the carving which represents Assur-bani-pal feasting in his garden with his enemy's head hung on a tree. There is no doubt that the heads of the slain were often salted or embalmed, and taken long distances and preserved long after defeat, among Assyrians and Egyptians alike. In this case the words "in his tent" may refer to the tent pitched in Jerusalem by David for the Ark (2 Sam. vi, 17), just as the sword was preserved "behind the Ephod" in the tent at Nob (1 Sam. xxi, 9).

Simeon and Levi.—The tribe of Simeon appears to have been scattered in David's time, and Judah—especially the family of Caleb—possessed their country (1 Chron. iv, 31). We have already seen that in the cases of Ai and Nob the topography of the Book of Joshua is earlier than 700 B.C. In the present case (Joshua xix, 1–9) it appears to be as early as David's time. The distinction in this book (xi, 21) between Judah and Israel would equally apply to the time of David's rule over Judah at Hebron, when the division between this tribe and the others (*see* Deut. xxxiii, 7) existed before the union of the whole nation. Very different conditions existed after the Captivity (Neh. xi). The most important differences are :—(1) After the Captivity men of Benjamin held cities belonging to the Levites (Anathoth, Nob, and Geba), others in Dan (Lod and Ono), and others destroyed by Joshua and Saul (Ai and Nob), not noticed in Joshua. (2) Men of Judah inhabited the cities of Simeon. (3) The Levite cities were inhabited by the two tribes in question, and no special cities of Levi are noticed, the only allusion to the Levites being that their "divisions" (מחלקות) were in Judah and Benjamin. Levi had no possession (נחלה) in Israel, but only cities and "environs" (סביבות) for grazing (Num. xxxv, 3)—48 in all, including the six cities of refuge. It is, of course, possible that the Levitical cities were never solely inhabited by Levites, but were appointed (about one in ten cities) as religious centres. In this case the frequent allusion to the Levite "within thy gates" in Deuteronomy may refer to such partial inhabiting of certain towns, though, as already mentioned, Levites might live (like Samuel in Ramah) at other places in the character of *Gur*. We have allusion to Anathoth as a priests' city in Solomon's time (1 Kings ii, 26), and to Levites at Bethshemesh in Samuel's time (1 Sam. vi, 15). It is unsafe to assume any corruption in the text unless it is proved by the evidence of versions and manuscripts, and such evidence shows only very minor errors. The institution of possessions belonging to priests and to temples is so ancient, in Babylonia and in Egypt, that we have no reason to suppose it was first instituted in Palestine after the Captivity, especially as it is not then noticed, but is alluded to in the earlier books of Judges, Samuel, and Kings.

The Tsinnor.—There is some doubt as to the translation of this word, rendered "gutter" and "waterspout" in the A.V. (2 Sam. v, 8 ; Psalm xlii, 7) ; in the latter passage it refers to some natural object—a flood or torrent, connected with "depths"—a word applied to springs. It has, however, been rendered "cliff" as well as "cataract" by an alteration of

the points, according to Ewald's rendering of the passage. "Whoso smites the Jebusite shall hurl the lame and blind ones from the cliff." The whole passage is difficult, and may mean that the Jebusites said, "Unless thou keep away from thee the lame and blind ones thou wilt not come in here, meaning that David could not come in. But David took the stronghold of Zion, that is the city of David. And David said on that day, Anyone who smites the Jebusites can also reach both the lame and the blind on the cliff. They have hated David himself, therefore they say he is lame and blind, he cannot come within." The name of the town *Sânûr*, in Samaria, north of Shechem, may be connected with the word *Tsinnor*. It is a strong site, on a hill above a flat plain, but has no waterfall or gutter, only a cliff with walls.

Baal Perazim and the Valley of Rephaim.—The topography of this episode (2 Sam. v. 17–25) is remarkable. David "went down" to the "hold" (by which term Adullam is often meant, *cf.* 1 Sam. xxii, 5), but "went up" against Philistines in the Valley of Rephaim. The latter was south of Jerusalem (Joshua xv, 8 ; xviii, 16), and the allusion is probably in this case to the head of the deep valley (עמק), now *Wâdy Serâr*, the direct route from Gath (*Tell es Sâfi*) to Jerusalem. At Adullam David flanked this advance. The name of Baal Perazim may linger at *'Ain Fâris*, and have belonged to the high ridge north-east of Adullam, and south of the Valley of Rephaim, to which David would "go up" from Adullam and so be above the Philistines in the valley. In the second case, instead of going up he "went round to the west," and came "in front of Becaim." The passage following may be rendered : "When thou hast heard a sound of marching on the hilltops (ראשי) of Ha Becaim, then thou shalt bestir thyself." Finally (verse 25), David smote the enemy from Geba to Gezer. Becaim is rendered by various writers "mulberries," "balsam trees," and "poplars," but none of these trees grow anywhere near Jerusalem, and poplars could not live in so dry a region. Trees are not specified at all. The Geba in question is probably Geba of Judah (*Jeb'a*), on the hill north-east of Adullam, and there is a ruin just west of it called *Habeik*, which might preserve the name of Ha Becaim. In this case the Philistines left the direct route and turned south to Adullam, where David was to await them, while they occupied the ridge which he had held on the previous occasion. Marching north for two or three miles he would be on the west of the hills near Geba, and so cut off Philistines just ascending by the southern road from the Valley of Elah to Jerusalem. The whole topography of the two contests thus seems intelligible. Geba of Judah is noticed in Joshua (xv, 57) with Timnah (*Tibneh*, a little further north), and it is to be noticed that the Valley of Rephaim is only mentioned on the border of Judah in connection with a hill to its north. If the head of the valley is intended, the hill just south of Jerusalem is north of the source of Wâdy Serâr. The name of *'Ain Fâris* is spelt with *Sin* instead of *Sad*, but this may be a corruption, *Fâris* meaning "Persian," whereas *Perez* (with *Tsade*) is not a common Arabic word. The Valley of Baca (Psalm

lxxxiv, 6) may also be connected with this place called Becaim (in the plural), and would be a main route to Jerusalem for pilgrims. The term *Baca*, "weeping," probably means drippings of the rocks, as opposed to plenteous springs, the context giving the contrast, "crossing by the Emek ha Baca find it full of springs, the rain truly has covered it with blessings." The appearance of the hard limestone ridges of this particular region, after rain, is very remarkable. They gleam with the waters which drip from the rocks and cover the ledges. This would be the case at the time of Passover, whereas in summer they are dry, the only large spring in the valley near Geba being 'Ain Fâris.

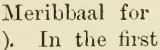
Goren Nachon, otherwise *Goren Chidon* (2 Sam. vi, 6; 1 Chron. xiii, 9), was a place between Kirjath Jearim and Jerusalem, where the Ark was left in the house of Obed Edom. It was lower than Jerusalem (verse 12), but probably above Kirjath Jearim, and it was probably not quite on the road (verse 10). The site of *Jûrah*, a village about two-thirds of the distance from Kirjath Jearim to Jerusalem, just north of the direct road, would be suitable, and may preserve a trace of the word Goren.

The Tent.—It is supposed that "the tent" in which the Ark was placed in Jerusalem (2 Sam. vi, 17) was not the original Tabernacle, because, according to the Chronicles, as already noted, the latter was at Gibeon. It is not mentioned in the Book of Kings as being at Gibeon, but may have been placed there later than the seventh year of David. The expression "in its place" would seem to show that the Ark was placed in its proper tent—the Tabernacle. The definite article occurs "in the midst of the tent" (בתוך האהל) (*see* 1 Kings viii, 4).

Names and Titles.—The discrepancies as to personal names and titles in various passages in the O.T. were often observed by the Jews (as in the A.V. margin) long before modern criticism arose. Explanations were suggested, but the text was preserved. Unscrupulous copyists or editors might have erased these differences, and their existence is evidence of early respect for the written text. None could fail to observe that the father-in-law of Moses is sometimes called Jethro, and sometimes Reuel or Raguel. David's sons are said to have been priests (2 Sam. viii, 18), though in the Books of Samuel generally the priesthood is confined to the family of Aaron. These differences are, as a rule, far too great to be explained by a scribe's mistake between two or more similar letters. An explanation of such discrepancies may, however, at once be found if we suppose that the Cuneiform character was still in use in David's time—as among the earlier Canaanites—and the alphabet not yet introduced.[1] The Cuneiform

[1] The theory of an alphabet existing before 2000 B.C. in Arabia appears to me utterly unsound, contradicted by the forms of the letters, and by the distinction of later sounds unknown in the oldest Semitic alphabets. The suggestion of a Hittite origin for the alphabet has been disputed by one critic, who, however, involves himself in the paradox that the characters derived from the Hittite (Cypriote) are found in Egypt as early as 2900 B.C., but that the original script, whence these are derived—that is the so-called Hittite—is not older than 700 B.C. In both dates he is wrong.

emblems had in each case more than one sound, and might be variously transliterated. The author of Chronicles appeals to records of David's time (1 Chron. iv, 22; ix, 1; xxvii, 24; xxix, 29), which are not found in the extant Books of Samuel. He speaks of David's sons, not as priests, but as "Chiefs at the King's hand" (1 Chron. xviii, 17): he gives Eshbaal for Ishbosheth, Meribbaal for Mephibosheth, Abinadab for Ishui (1 Chron. viii, 33, 34). In the first case the explanation may be as follows, from the Cuneiform :—



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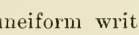
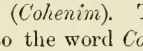
The meaning of these signs is "a chief man" (in Assyrian, *Rab-saku*, "General"—Rabshakeh, 1 Kings xviii), but it might be taken by the transcriber as phonetic, and so rendered *Cohen* (כהן) "priest," the soft *h* not being marked in Cuneiform writing. In the later account (1 Chron. xviii, 17), Benaiah is said to have been "over the Cherethites and Pelethites," but not in the earlier (2 Sam. viii, 18), which reads, "and Benaiah, son of Jehoiada, and the Cherethites, and the Pelethites, and David's sons were Chiefs" (*Cohenim*). The same meaning is supposed (A.V. margin) to attach to the word *Cohen*, applied to the father-in-law of Moses (Exod. ii, 16) and to Potipherah (Gen. xli, 45). As to the name of the former it may have been written

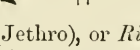


This could be read either *Iteru* (Jethro), or *Rikhu alu* or *Ri'ualu* (Raguel or Reuel), in Hebrew יתרו and רעו אל, meaning "pre-eminent" and "ruler of the camp" (or "city").

The Chronicler reads Bosheth for Baal, the first word meaning probably "living" (from *basu*, "to exist"), and if the name of the deity was originally



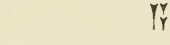
which is a known title for one of the gods, meaning "the living God," it can be rendered either *busitu*, "living," or *belu*, "Lord," and thus *Bosheth*, or *Baal*. The name of Jonathan's son would then be written in the original document



which may be read either *Mipi busitu*, or *Mirub belu*; that is either Mephibosheth or Meribbaal.

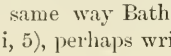
Many of the other discrepancies as to personal names are easily accounted for on such a principle, the true reading of such names being always subject to doubt in Cuneiform, unless established by variant spelling. No error in transcribing letters of an alphabet would account for *pi* instead of *rib*, or for *Bosheth* instead of *Baal* but the "polyphony" of the Cuneiform will account for these and other variations in names and

titles. The name of Abinadab and that of Ishui (or Ishvi) have no visible connection, but it may have been written



This means "Father of giving"—like Abinadab, "Father of liberality," and the signs may be read either *abi nad-ab*, or *isevi* (or *aisevai*).

In the same way Bathsheba is also called Bathshua (2 Sam. xi, 3; 1 Chron. iii, 5), perhaps written



which might be read either Bathshu'a or Bathseb'a.

Bathsheba.—There seems no reason to suppose that this lady was a Hittite (2 Sam. xi, 3; xxiii, 34), as the family names are Hebrew. She was the granddaughter of Ahithophel, whose pernicious influence may have originated with her. If she was a Hittite, Solomon was half Hittite, but her name and that of her father are Semitic. That the Hittites were non-Semitic is very generally agreed. An anonymous reviewer of late has stated that "specialists" will not admit that they were Mongols, but without giving any names. This is a mistake, for the late Dr. Birch held them to be so, and Dr. Sayce has said the same in print. Sir H. Rawlinson held that many of the tribes on the borders of Syria were Mongol. Dr. Isaac Taylor adds the Etruscans to the list on very good grounds. That the Akkadian of Mesopotamia was a Mongol language is very generally admitted, and can only be doubted by those who have not studied this tongue. The relation of Tarkhundara's Hittite letter to the Akkadian (and so to Mongol speech) has also been admitted. No names of equal weight will be found on the opposite side of the question. The Hittites, however, early intermarried with Semitic and Egyptian stocks, and even Uriah may have been only a half-bred Hittite married to a purely Hebrew wife.

Rabbath Ammon (2 Sam. xii, 26).—The A.V. reading which makes Joab take this place seems confused, and it would appear better to render the words (עיר המלוכה), "a city of the kingdom," which he terms (v. 27) "the city of waters"—probably on the Jabbok. Rabbah itself was then taken by David.

Bahurim.—This place is only noticed in David's history, and is not found in lists of cities. The Targum of Jonathan identifies it with Almon (otherwise Alemeth), now *'Almît*, and the position is suitable. There is a connection between עלם, "youth," and בחור, "choice youth," which may have suggested this view. The place where David "took breath" (2 Sam. xvi, 14) is not specified, and the name has been thought to have dropped out of the text, but it may very well have been Bahurim (*see* verse 5).

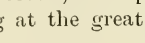
Nahash and Jesse (2 Sam. xvii, 25; 1 Chron. ii, 13, 16).—According to the chronicler, Joab and Amasa were nephews, or half-nephews, of David. In Samuel, David also addresses the latter as a relative (2 Sam. xix, 13),

but Nahash stands for Jesse in this book. As, however, *Nakhasu* means "prospering" in Assyrian, and Jesse is usually rendered "wealthy," the difference may be due to an original ideogram having both sounds.

The Berites (הַבְּרִים, 2 Sam. xx, 14), mentioned with Abel Beth Maachah, are supposed to be *Bahurim*, or "young men," by the Septuagint translators. The term seems rather to be geographical, and on the boundary of Galilee, according to the Talmud, was a place called *Berîi*, which is now *Beriâs*, to the south-west of Abel (*Abil*). The Beth Barah of Judges (vii, 24), which is often wrongly supposed to be the same as Beth 'Abarah, was in Ephraim, and the root is not the same as in the word Berites. Probably it comes from בָּרָה, "to feed," and it was near the "waters" held, to Jordan, by the Ephraimites. Not impossibly it is the present *Beit Fûr*, near the head of the great stream (Enon) which bounded Ephraim on the north. Lining this boundary, all along the "waters" to Jordan, the Ephraimites prevented the defeated Midianites from crossing at the great Dâmieh Ford and forced them back towards Gideon.

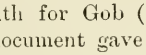
Abel.—The speech of the wise woman to Joab (2 Sam. xx, 18, 19) is difficult to translate, and a theory has arisen from it that this city was a sacred place. The true rendering may perhaps be: "They speak a speech especially to say that they ask a question in Abel, and so decide thou it. I am seeking things for the true peace of Israel, thou to destroy a city and a mother in Israel. Why dost thou destroy the heritage of Jehovah"? The mother in question may mean the speaker herself.

Merab and Michal (2 Sam. xxi, 8; 1 Sam. xviii, 19).—It seems clear that Michal is an error for Merab in the later passage, as Michal did not marry Adriel, and had apparently no children. The two names (מִיכַל and מֵרַב) would easily be confused if written in Cuneiform—



The second sign has the sounds *Cal* and *Rab*, and the whole could be read *Merab* or *Mical*.

The Sons of the Giant (2 Sam. xxi, 16–22; 1 Chron. xx, 4–8).—The later account reads Gath for Gob (גֹּב), and Gezer for Gob (גֹּוב). Possibly the original document gave a sign reading *Gatu* or *Gubu*, as does one Cuneiform sign. Another Cuneiform sign has the sounds *gazaru* and *gut*. Probably the true reading throughout is *Gath*. The account of the "New Sword" (verse 16) has raised the supposition that חֲדָשָׁה ("new") was the name of a weapon. The Septuagint says "a club"



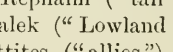
is a Cuneiform sign for a "mace," and may be read *Khad-su*, which perhaps is the explanation.

The names of the giants, *Saph*, *Lahmi*, and *Ishbibenob*, appear to be Semitic, meaning probably "big," "warrior," and "he who rests in Nebo." As to the Philistines generally—the giants being of that race—

the monumental as well as the Bible names of these "migrants" are Semitic. Goliath may also be compared with the *Gulata* of Joppa mentioned in the Tell Amarna texts; and the Assyrian *Gula* means "great."

Zelah (צֵלַע) was a place in Benjamin (2 Sam. xxi, 14; Joshua xviii, 28), apparently near Gibeah (*Jeb'a*), Saul's home. The word means "cliff" or "slope," and may be connected with the cliffs near Michmash (1 Sam. xiv, 4). Similar cliffs occur in *Wâdy Redeideh*, just south of Gibeah, and above them is the curious rude monument now called "Graves of the Children of Israel." There is a possibility that these might represent the graves of Saul and his family. They are fully described in the Survey "Memoirs," vol. iii, pp. 101, 102.

The Jebusites (יבוסי) were inhabitants of Jerusalem till David's time. According to Ezekiel (xvi, 3), this population was a mixture of Amorites and Hittites; that is to say, partly Semitic (Aramean), partly non-Semitic (Mongol). The ancient tribes of Palestine generally (*see* Gen. xv, 19–21, &c.), may be grouped under these two heads, some of the titles having a well-known Semitic meaning, others being untranslatable as such, but easily explained by Mongolic words. The first class includes Canaanites ("lowlanders"), Amorites (perhaps "highlanders," or possibly "people of the cities"),[1] Perizzites ("villagers"), Hivites ("tribesmen" or "villagers"), Kenites ("spearmen"), Kenizzites ("hunters"), Kadmonites ("Easterns"), and Rephaim ("tall men"). The other class includes Anak ("tall"), Amalek ("Lowland tribe"), Girgashites (probably "mountaineers"), Hittites ("allies"), and Jebusites. The last word has no Semitic meaning, but may be explained by the Mongolic *Eb-uśu*, meaning "Abode of Safety" (Akkadian, *ab*, *ib*, or *ub*, an "abode," and *us* or *uz*, "rest," "safety"; Turkish, *eb*, "abode," and *iś* or *iiś*, "confidence"), so that the non-Semitic name of Jerusalem had the same meaning as the Semitic *Yeru-salim*, "abode of safety." From the Tell Amarna letters we know that the Jerusalem Amorites (*see* Joshua x, 5) called the city *Urusalim* in the fifteenth century B.C. Jebus (*Yebuś*) was thus the Hittite term, having the same meaning in their language. The name of Araunah or Ornan, the Jebusite (2 Sam. xxiv; 2 Chron. iii), is variously spelt (ארנן, אורנה, ארניה), and has no Semitic explanation. Probably it was a Hittite name, *Ur-nin*, *Uru-nin*, or *Ur-ni*, written in Cuneiform—



The meaning would then be: "Priest of Nina"—the goddess called Baalath in Semitic speech. The name *Urnina* is well known in Mesopotamia as that of an Akkadian ruler (in Assyrian, *Calab Belti*).

[1] Dr. Sayce supposes the Amorites to be Aryans. Their language, however, was Aramaic, as are all the personal names among them yet known from the Bible, and the monuments. Dr. Petrie speaks of the colour of their faces on monuments as red. All such faded colours are, however, unsafe arguments.

NOTES ON THE JULY "QUARTERLY STATEMENT."

I.—By Colonel C. R. Conder, LL.D.

Jar-handles.—I do not see it suggested that the figure on these handles is a rude scarabæus, such as is found in Babylonia as well as in Egypt. Comparing the letters with those of the Moabite stone, Siloam text, and Hasmonean coins, it seems impossible to regard the texts as being as late as the second century B.C., or as early as the seventh, and a date about 500 B.C. would probably suit best. The letters on the jar-handle from Tell-es-Sâfi are all, however, later than the rest, and probably belong to the second century B.C. To attribute the Siloam text to a late date seems to me increasingly difficult, when we consider the *vau* in these texts: to say nothing of the evidence afforded by the Beni Hezir tomb, the texts of the Galilean synagogues, of Phœnicia, Palmyra, and of Babylonia in the fifth century B.C. The fact that towns appear clearly to be mentioned, coupled with the absence of the article before the word *Melec*, might perhaps be best explained by reference to local deities rather than to any king. It is not clear why the property of kings of Hebron, Ziph, and Socho should be found at another place. We know that deities were often named after towns, *e.g.*, "Istar of Arbela," "Set of Sarpina," &c., and local Molochs may thus have been invoked to safeguard the vessels. Some of the accompanying seals, &c., resemble the later Phœnician remains; and Egyptian influence continued in Phœnicia to at least the third century B.C., and is indeed then more marked than in earlier times. Even the occurrence of the name of Thothmes III, badly copied, is not evidence of very early date, for the Phœnicians used to put his name (also badly copied) on glass of a much later age. While, therefore, there is much to show a period earlier than that of the Hasmoneans, great caution should, I think, be observed in suggesting that remains as early as the fifteenth century B.C. have been discovered. The alphabet was not then in use, as we may deduce from the Lachish discoveries. In the present case no cuneiform tablets occur, such as would prove the real antiquity of the site. The circular vault in the ruins is probably of Roman, or Byzantine, date; and the statuettes from Tell-es-Sâfi also appear to be very late—perhaps of the second century A.D.

The Cubit (p. 228).—The smaller cubit, used for measurement of vessels, &c., is that to which I have referred as about 13½ inches. The building cubit was not of necessity of the same length in all ages, any more than were the Jewish weights (which also differed locally in the second century A.D. in Galilee and in Jerusalem), but the measurements of Herod's Temple, and of the Galilean synagogues, seem to me to agree with Talmudic statements in indicating a cubit of about 16 inches, as used at all events in later times. The actual measurements of specimens of Egyptian cubits show variations, and great accuracy may perhaps never

have been attained in either weight or measure, while gradual changes almost certainly occurred.

The Twelve Stones (p. 273).—It certainly was not my intention to suggest that these were erected on Gerizim. It is a Samaritan tradition, but probably without foundation.

The Gibeon Miracle (p. 270).—I do not think the paper quoted at all exhaustive. It does not deal with all the Hebrew words used in the passage. Nor do I see much difference, from an astronomical point of view, between "stopping" and "tarrying" of the sun or moon.

II.—By Professor Clermont-Ganneau, LL.D.

Tell es-Sâfi (p. 190).—For the two Welys and the presumed date of their construction *cp.*, in addition to Rey (not Key), the observations of Guérin ("Judée II," p. 91), which go back to 1863. The locality figures upon the mosaic map of Madeba, under the suggestive Greek name of *Saphîtha* (*see* my "Recueil d'Archéologie Orientale," vol. ii, p. 170), a name which proves that it was still flourishing during the Byzantine period.

Statues (p. 196).—As far as I can judge from the inadequate engraving, the fragments of the statues rather recall the Greco-Cypriote style.

Mediæval Tooling of the Crusaders (p. 193).—I am glad to see that Dr. Bliss takes the law of "mediæval toolings," which I discovered and formulated in 1874, and which forms a safe and valuable diagnosis of stones cut by the Crusaders, more seriously than did his former collaborator, Mr. Dickie. The fact that he has ascertained its existence in the constructions of Tell-es-Sâfi ("the dressed stones all showed signs of the fine diagonal Crusading chiselling") is a remarkable verification of this law, since history informs us that the Crusaders had raised their fortress *Blanche Garde* at the very Tell-es-Sâfi. I think I may predict that if Dr. Bliss will examine the blocks in question more closely, he will in addition discover, at least upon some of them, *masons' marks* borrowed from the Latin alphabet or the current mediæval symbolism of the West.

Hebrew-Phœnician Stamp on Jar-handle (p. 198).—The second name must, I think, be read *Yehokal*, not *Yehohel*, *Yoel; Yehokal*, in spite of what Professor Sayce says (p. 212), is a Hebrew name of perfectly good formation and found in the Bible (Jer. xxxvii, 3). The first word, רפתי, however, may be the true reading,[1] is certainly a proper name, not a substantive or even an ethnical name. I have already made known several archaic Hebrew seals, with two proper names in immediate juxtaposition.

Gath (p. 204).—The hypothesis of the possible identity of Gath and Beit Jibrîn is not new. It has been long ago put forward by Hitzig. Although now completely discredited, I think it nevertheless deserves to

[1] The *resh*, somewhat doubtful, is to be verified by the original.

be reconsidered. I have treated the question in detail in the part of my "Recueil d'Archéologie Orientale" that is now in the press (vol. iii, 18th livr., p. 273).

Handles of jars with Hebrew-Phœnician stamps (p. 204).—It is remarkable to see that this congeneric *ensemble*, which at the present day is considerable and supplied by Jerusalem, Tell Zakarîya, and Tell es-Sâfi, can be divided into two groups, characterised, the one by the symbol of the Egyptian *scarab*, the other by the symbol of the *winged disc*, which is equally Egyptian. We may ask whether these different symbols do not correspond to differences in the origin of the jars; perhaps they are marks peculiar to different kings, or rather factory marks distinguishing the different royal pottery manufactories where the jars were made.

Inscription from Palmyra (p. 269).—The reading ספרא רומני ("a Roman reckoning"), not to mention philological objections, does not seem materially possible, according to the facsimile. We know, besides, from a Nabathæan inscription ("Corpus Inscr. Semit. II," No. 161), how this idea was expressed in Aramaic Syrian במנין ארהומיא [1] ("according to the computation of the Romans"). We see from this how far the authentic expression is removed from the proposed reading.

The Hypogæum of the Kings of Judah (p. 273).—The process of boring, extolled by Mr. Birch, for the purpose of directly reaching the sepulchral chambers of the royal hypogæum, has been already and expressly indicated by myself in the extensive study I have devoted to the question, as he will be able to convince himself if he will consult vol. ii of my "Recueil d'Arch. Orient.," p. 292, in the Palestine Exploration Fund Library. My words are:—"At the same time one might perhaps try *to recognise and reach directly the cavities of the hypogæum by boring holes in the rock, with the aid of appropriate appliances.* In this case I would recommend borings along the strip between the parallels ZH and XX." [2]

PARIS, *July 16th*, 1899.

III.—By Professor LUCIEN GAUTIER.

(1.)

P. 198. Dr. Bliss says, concerning the word יהואל (line 7 from below):—". . . . the combination of יהו (Jahveh) with other words in a proper name is common. The meaning of the name is thus: 'Jehovah is God.'" So far Dr. Bliss is quite right. But he adds: "As an example of a proper name of similar composition we may cite Jehiel — 'Jehovah liveth.'" This comparison is not exact. Jehiel (= "God liveth," not "Jehovah liveth") does not contain the name

[1] The true reading, which had escaped Professor Sachau, has been settled by me in "Recueil d'Arch. Orient.," vol. i, p. 67.

[2] Lines marked on my plan.

Jahveh, and is composed of the name *El* with the verb יחי (not ידי). The name יהואל contains both Jahveh and El, and similar are: (*a*) אליהו, which has the same meaning; (*b*) names like אביאל, "God is father"; (*c*) names like יהונדב. The question whether the frequent name יואל is a contraction of יהואל is not settled; it might be a participle of יאל (*cp.* Baudissin, "Studien," I, p. 223).

(2.)

P. 210. Professor Sayce remarks (line 9 from below):—"It is curious that we invariably find למלך instead of להמלך with the definite article." There is certainly something very curious, even striking and surprising here, not in the inscription however, but in the Professor's remark. Has the learned Assyriologist forgotten the elementary and well-known rule of Hebrew grammar, rule with only a dozen exceptions in the whole Old Testament, that when the prepositions ב and ל and the particle כ are prefixed to a noun with the definite article, the ה of the article disappears, and its vowel is placed under the prefix, the first consonant of the word remaining with *dagesh forte*, *explicitum* or *implicitum*? The four consonants למלך can be read as well *lammelek* as *lemelek* (as well *with* as *without* the article). The consequences drawn by Professor Sayce from an imaginary fact are therefore entirely without foundation. Former experience, concerning the Siloam inscription, ought to make one cautious with regard to suppositions about Phœnician language in Hebrew inscriptions (*cp. Quarterly Statement*, 1881, pp. 72 and 144).

GENEVA.

THE ANCIENT STANDARDS OF MEASURE IN THE EAST.

By Lieut.-General Sir Charles Warren, K.C.B., F.R.S., R.E.

(*Concluded from p.* 268.)

XIV.—Weights—Babylonian and Hebrew.

We shall now be able to apply a test to the number of grains found to a log by examination of the Babylonian weights, viz.: Given 5,104·16 barley grains to a log—what is the weight of the log of water in terms of these grains, $\frac{5{,}104{\cdot}16 \times 175}{123{\cdot}3} = 7{,}244$ grains.

The number of grains weight in a log = mina is likely to be 7,200, to keep up the symmetry of the system of 3×2, as will be seen hereafter. This is the number Madden arrived at in the Babylonian system of weights (Madden's "Jewish Coins," pp. 267, 289). We may therefore take the relative weights of water and pressed barley in a log to be 7,200 : 5,104·16.

$$100 : 70{\cdot}89.$$
$$141{\cdot}7 : 100.$$

As already shown, there were 80 minæ of 8,187·5 Imperial grains each to $\frac{2}{3}$ cubit cubed of rain water; and this same weight of $\frac{2}{3}$ cubit cubed has been considered by the various authorities to represent the weight of the talent.

Hussey ("Ancient Weights and Money") mentions that—

Varro said that 80 Roman pounds $\left(\frac{2}{3}\text{ Roman cubit cubed}\right)$ = Egyptian talent,

Polybius said that 80 Roman pounds $\left(\frac{2}{3}\text{ Roman cubit cubed}\right)$ = Euboic talent,

Livy said that 80 Roman pounds $\left(\frac{2}{3}\text{ Roman cubit cubed}\right)$ = Attic talent,

and it seems to be accepted by modern writers that the Babylonian cubic foot of water weighed a Babylonian talent.

Böckh (as quoted in "Class. Mus.," vol. i, p. 4, by Grote) says:—"The Babylonian cubic foot, standing as it does in the ratio of 3 : 2 to the Grecian cubic foot, weighs 60 Eginetan minæ (= 60 Babylonian minæ = 1 Babylonian talent)."

I therefore assume that the weight of the ancient talent was the weight of $\frac{2}{3}$ ancient cubit cubed of rain water, *i.e.*, $\frac{70{,}000}{27} = 2{,}592{\cdot}59$ cubic inches, or $\frac{70{,}000 \times 252{\cdot}6428}{27 \times 7{,}000} = 93{\cdot}57$ lbs. avoirdupois, or 655,000 Imperial grains, or 576,000 ancient grains.

Among the Grecians the unit was the talent, and was thus divided:—1 talent, 60 minæ; 1 mina, 100 drachmæ; 1 drachma, 6 obols.

The Babylonian talent appears also to have been divided into 60 minæ for monetary purposes, but the Hebrew talent is variously computed as divided into 50 or 60 minæ, probably according to whether it was of gold or silver, the golden double talent being 100 minæ and the silver talent 60 minæ, the single talent in either case being represented by $\frac{2}{3}$ cubit cubed of rain water.

We may then consider the ancient talent of 655,000 Imperial grains to have been divided as follows:—

	Mina.		Proportions.
	Imperial Grains.	Ancient Grains.	
For ordinary weights, 80 minæ	8,187·5[1]	7,200	15
For silver .. 60 „	10,916·6	9,600	20
For gold (single) 50 „	13,100	11,520	24
„ (double) 100 „			

giving respectively to the minæ proportions of 15, 20, and 24.

The following relative proportions of the Grecian talents are given by ancient writers and accepted in the articles in Smith's

[1] This is the Hebrew log, and corresponds to the pound in the Grecian and Roman systems. As will be seen subsequently, the early Grecian pound is two-thirds 8,187·5, or 5,458·3 Imperial grains.

"Biblical Dictionary" and "Dictionary of Greek and Roman Antiquities":—

(1) That the old Macedonian, Eginetan, or Babylonian talent bore to the Euboïc or old Attic talent the proportion of 6 : 5, and to the Solonian or newer Attic talent the proportion of 5 : 3.

(2) The Euboïc talent thus bore to the Solonian the proportion of 100 : 72, or 25 : 18.

Authorities also agree that there were 3,000 shekels to a silver talent. We shall thus have the following proportions[1]:—

—	Imperial Grains.			Ancient Grains.			Proportions.		
	Talent.	Mina.	—	—	Mina.	—			
Babylonian..	655,000	10,916·6	Shekel. 218·3	576,000	9,600	Shekel. 192	6	5	—
Eginetan ..	655,000	10,916·6	drachma 109·16	576,000	9,600	drachma 96	6	5	—
Euboïc ..	545,833	9,097·2	90·97	480,000	8,000	80	5	—	100
Solonian ..	393,000	6,550	65·5	345,000	5,760	57·6	—	3	72

It will thus appear that the ancient silver talent contained 3,000 shekels of 218·3 Imperial grains each, while the Eginetan talent contained 6,000 drachmæ of 109·16 Imperial grains each. The golden mina also was divided into 100 golden darics 131 Imperial grains each. We can now ascertain how far the weights of existing coins are in accordance with these deductions.

Hussey ("Ancient Weights and Money"), after many trials, gives the shekel of Simon Maccabæus as weighing 218 Imperial grains, or about half Roman ounce, and cites Arius Montana, Villanpandus, Greaves, Mersennus, and Eisenschmidt as giving the weight of the shekel as from 218 to 220 grains, and Barthelmy as giving it as 217 grains.

Madden ("Jewish Coinage") considers 220 to be the average weight of the Maccabæan shekel; in any case the difference is

[1] From these proportions it will be seen that the Eginetan talent contained 10,000 Solonian or Attic drachmæ, as stated by Pollux (ix, 76, 86).

only 1 per cent., and as there are just 3,000 shekels at 218 grains to an ancient silver talent, I have taken 218 grains as the ancient weight of the shekel.

By taking 220 grains to a shekel, Madden makes the weight of the silver talent some 5,000 grains heavier (660,000 instead of 655,000) than the weight deduced by me.

As to whether the shekel of the Maccabees was the same weight as that in use before the captivity we have no means of ascertaining, and the Talmudists seem to think it was increased in weight subsequently.

Modern authorities, however, seem to agree in supposing that the weight was the same, and the present deductions support that view.

Hussey gives 66·5 Imperial grains (from actual trials) for the new Attic drachma, and Greaves gives 67 Imperial grains, while the weight deduced from the ancient talent and proportion of 5 : 3 is 65·5 grains.

No drachmæ of the Euboïc standard appear to have been examined, but Hussey's deduced value is 92 grains, and Böckh's value is 93½ grains, while the weight now deduced is 91 grains. There appear to have been no comprehensive trials of the Eginetan coins except by Hussey, who made the weight of a drachma but 96 grains, whereas it should be 109 grains, but the writer of article "*Nummus*" in Smith's "Dictionary of Greek and Roman Antiquities" states that there are coins of the Eginetan system which come up nearly to the full theoretical weight.[1]

The table of weights from Nineveh (Layard's "Nineveh and Babylon"), some of which are in good preservation, gives several tests of the weight of the mina, and Madden considers that one of 15,984 Imperial grains is up to full weight, and represents two minæ of 7,992 grains. The weight deduced from the ancient cubit is 8,187·5, giving a difference of 188 grains, or nearly 2 per cent. This may be owing to a depreciated cubit having been in use at the time (700 to 800 years B.C.), or else to the weight not being up to the full standard.

Madden allows 60 of these weights to a talent, and thus deduced a *lighter* Babylonian talent of 479,520 Imperial grains. I venture to think that these weights belong to the commercial

[1] Namely, those of Melos and Byzantium, both Dorian settlements, and those of the Macedonian Kings before Alexander the Great.

weights of Babylon, 80 to a talent, and that they simply form portions of the talent of 655,000 Imperial grains.

Madden further, by taking 67·5 grains to an Attic drachma, arrives at a lighter Babylonian talent of 486,000 Imperial grains. It is, however, pointed out by the writer of "*Nummus*," Smith's "Dictionary of Greek and Roman Antiquities," that it was the *old* Attic or Euboïc mina of which there were 72 to a Babylonian talent. The weight of this mina was about 9,097·2 Imperial grains, which again gives 655,000 Imperial grains to a Babylonian talent. In consequence of the introduction of the lesser Babylonian talent by Madden, there is great discrepancy in the estimates as to the Greek talents given in Smith's "Greek and Roman Antiquities," and in Smith's "Biblical Dictionary." I have no doubt that the former is more correct.

At the rate of 50 golden minæ to a talent of 655,000 grains, and 100 golden darics to a mina, we have the weight of a daric as 131 Imperial grains. Madden gives the weight of the Persian daric as 129 Imperial grains, and others of 124 to 126 grains, and Mr. Borrell gives the weight of the double daric as about 256 grains.

XV.—Grecian, Roman, and other European Measures.

Although the weight of $\frac{2}{3}$ ancient cubit cubed in rain-water was used as a standard weight of a talent at a very early period, yet this measure does not seem to have been used as a standard of linear measure in early days as it was subsequently in Greece and Rome under the name of the foot. It apparently did not become a standard of linear measure until the length of the cubit was reduced.

The division of the $\frac{2}{3}$ cubic cubit into 80 parts (or logs) is very simple.

$\frac{2}{3}$ ancient cubic cubit is $4\frac{2}{3}$ palms cubed, whilst a log is $(1\frac{1}{12})^3$ palms.

$$(4\tfrac{2}{3})^3 : (1\tfrac{1}{12})^3 :: 80 : 1 \text{ nearly.}$$
$$175{,}616 : 2{,}197.$$

Giving a discrepancy of about $\frac{1}{1000}$.

The Roman cubic foot was divided into 80 pounds in the same manner, and from this coincidence, and the similarity which exists

between the Grecian and Roman and the ancient Babylonian measures of capacity, it has been considered that the former are derived from the latter. It will be shown subsequently that many of the original Grecian and Roman measures are identical with the Babylonian, and it is evident that there is no intimate connection between the binary system of Egypt and the measures of capacity of Rome and Greece.

There are $\left(2{,}048 \times \frac{10}{8}\right) = 2{,}560$ Egyptian hons in a double cubit cubed—

$\therefore$ 320 hons in a cubit cubed.

$\therefore$ 80 hons in (cubit $\div \sqrt[3]{4}$)^3 = 13 cubic inches cubed = 1 bushel.

$\therefore$ 10 hons = 1 gallon. (*See* Tables VI and IX.)

Thus it will be seen that 80 hons are less than $\frac{2}{3}$ cubit cubed.

The $\frac{2}{3}$ cubit cubed or cubic foot of Greece, Rome, and of Europe generally is about two-thirds the capacity of that of Babylon, and the question arises whether this is due to the gradual depreciation of the cubit of 20·6109 inches to about 18 inches, or to a deliberate change of unit for purposes of convenience.

No doubt the old system of working in palms had many inconveniences, and the new unit of 70,000 to a double cubit cubed could not be fairly brought into use generally so long as the standard of length remained a broken number of inches, viz., 20·6109. The change that was made was a very simple one, by which the new pound (80 to a cubic foot) became half the monetary mina of which there were 60 to an ancient cubic foot or talent, and by which the standard cubit of 20·6109 inches became 18 inches, and the double cubit became a yard or 36 inches.

This change consisted simply of reducing the content of the double cubit cubed by one-third, and using the side cube of this remaining bulk as the new standard of length.

It was discovered that 70,000 is nearly exactly $\frac{3}{2}$ $(36)^3$.

$$(36)^3 = 46{,}656{\cdot}0$$
$$\tfrac{1}{2}(36)^3 = 23{,}328{\cdot}0$$
$$69{,}984{\cdot}0$$

Difference, 14 in 70,000, or $\frac{1}{5000}$,
or if 70,041·6 is taken, then $\frac{1}{1000}$.

The result of this change is tabulated below:—

Double cubit. Content cubic inch.	Inches. Cubit.	Inches. ⅔ cubit.	⅔ cubit cubed C.I.	C.I. in mina or pound.	Imperial grains.	Ancient grains.	—
70,000	20·6109	13·7406	2,592	32·4	8,187·5	7,200	Commercial mina.
				43·2	10,916·6	9,600	Silver mina.
46,656	18·0	12·0	1,728	21·6	5,458	4,800	Pound.

It was M. Böckh ("Metrol. Untersuch") who first called attention to the ratio in saying "that the Babylonian cubic foot, standing as it does in the ratio of 3 : 2 to the Grecian cubic foot, weighs 60 Eginetan minæ (= 60 Babyloniau minæ = 1 Babylonian talent) of rain-water" ("Class. Mus.," vol. i, p. 4). To this Mr. Grote in his review of Böckh's work objects that "his proofs of the ratio of 3 : 2 between the Babylonian and the Grecian foot will be found altogether defective." It may have been defective in application owing to an incorrect length of the ancient cubit being taken, but yet it was right in principle. The application, however (strange to say), is to the English and not to the Grecian foot as it is now taken, and if it was correct then the Grecian foot must have been of exactly 12 inches, equal to our English foot, or else the ratio was not perfect.

M. Böckh also proposed a ratio of 10 : 9 between the Eginetan and Roman pound which Grote considers altogether inadmissible, and even denies that (properly speaking) there is any such thing as an Eginetan pound, or that there is any fixed normal relation between Grecian weights and Grecian measures, either of length or capacity.

At p. 753 Smith's "Dictionary of Greek and Roman Antiquities," *Mensura*, there is the statement with regard to measures of capacity that "they were not derived by a definite process of calculation from the measures of length, but were originally nothing more than the names of different sized vessels of no very definite capacity, which, when the metrical system came to be definitively constituted, were brought into harmony, on the one hand with the measures of length and on the other hand with

those of weight." So far this has not been found to be the case, the process of calculation being very definite.

According to the testimony of ancient writers the Grecian foot bears to the Roman foot the proportion of 25 to 24; on the other hand there is also testimony that the contents of the cubic foot, Grecian and Roman, were in the proportion of 10 to 9. This could not have happened at the same time, and as the ancient method of comparison was by content we may assume that the proportions of bulk or weight were of an earlier period and were the original proportions.

Now the various proportions of the talents were :—

Babylonian : Euboïc :: 30 : 25.
Babylonian : Solonian :: 30 : 18.
Babylonian : Grecian :: 30 : 20.
∴ Grecian : Solonian :: 20 : 18 :: 10 : 9.

Hitherto it has been a moot question how the Roman standard has been arrived at; I now suggest that it was nothing more than the Solonian system originally, bearing to the Grecian the proportion of 9 : 10.

That the Grecian and Roman systems may subsequently have somewhat appreciated may be admitted, but I have to observe that the exact dimensions of either are still matters of consideration.

In Table X the comparison of the various talents with weights of minæ and pounds is given. The mina is that for silver and the pound is the commercial mina for ordinary weights, 80 to a cubic foot; they bear the proportion of 4 : 3.

The Egyptian talent seems to be derived from the fourth part of the cubit cubed, instead of the third part or cubic foot, and it seems probable that it was considered equivalent to the Euboïc talent, from which it differs as 27·45 : 27.

If we now take the early Roman system to be the same as the Solonian we arrive at the following deductions :—

The Roman amphora quadrantal, or cubic foot = 48 sextarii. But the Roman cubic foot is—

$$\frac{2}{3} \times \frac{9}{10} = \frac{3}{5} \text{ Babylonian} = 80 \text{ logs} \times \frac{3}{5}.$$

∴ the Roman cubic foot = 48 logs.
∴ the sextarius = the log.

Also the metrêtês = $1\frac{1}{2}$ amphora = 72 logs.
But the bath = 72 logs.
∴ the metrêtês = the bath.

It follows that the seah must equal the urna, and the hin equal 2 Attic choes.

The kor also would equal 10 metrêtês.

This is all in accordance with the statements of Josephus, as follow:—

"Ant." viii, 2, 9..	..	Bath	= 72 xestæ.
		∴ Bath	= metrêtês.
"Ant." iii, 8, 3, and 9, 4..		Hin	= 2 Attic choes.
"Ant." ix, 4, 5 ..	..	Seah	= $1\frac{1}{2}$ Italian modii.
			= Urna.
"Ant." xv, 9, 2 ..	..	Kor	= 10 Attic medimni. (Metrêtês taken.)
"Ant." iii, 6, 6 ..	..	Omer	= 7 Attic cotylæ. (Xestes taken.)
"Ant." xiv, 7, 1 ..	..	Gold mina	= $2\frac{1}{2}$ Roman pounds.

$2\frac{1}{2}$ × 4,988 Imperial grains	=	12,475
Golden mina		13,099
		624 Difference, 5 per cent.

Epiphanius estimates the Hebrew talent at 125 Roman pounds—

12,475 × 50 = 623,750 grains to a talent.
655,000
32 Difference, 5 per cent.

Ancient Authorities.

Plutarch (Solon 15), on testimony of Androtion, "Solon made the mina of 100 drachmæ, which had formerly contained 73."

Actually 25 : 18.

Herodotus says Babylonian talent = 70 Euboïc minæ (iii, 89).

As 6 : 5 it really equals 72 Euboic minæ.

Pollux says the Babylonian talent contains 70 [old] Attic minæ and 7,000 Attic drachmæ (ix, 86).

Aelian (*l.c.*) said Babylonian talent contains 72 [old] Attic minæ.

Old Attic or Euboïc talent = $8{,}333\frac{1}{3}$ Solonian drachmæ.
Euboïc mina = $138\frac{8}{9}$,, ,,
$(138\frac{8}{9} \times 72) = 10{,}000$,, ,,

By decree B.C. 160 commercial mina = 138 drachmæ (of Solon). This decree raised the standard by adding 12 drachmæ to 138 and making it 150.

Mina = 150 drachmæ.
5 minæ = 6 minæ (old commercial).
Talent = 65 minæ commercial.

British Weights and Measures.

Linear.—It has been shown that the inch is almost exactly equivalent to $\frac{1}{70{,}000}$ double cubit cubed of the ancients, and that the foot and yard cubed are almost exactly two-thirds respectively of the $\frac{2}{3}$ cubit and double cubit cubed.

	Cubic inches.
The double cubit (41·2218 inches) cubed =	70,045·6
$\frac{3}{2}$ of the yard (36 inches) cubed =	69,984·0
	61·6 About $\frac{1}{1000}$.

But if 70,000 cubic inches is taken the difference is $\frac{1}{5000}$.

Square measure is evidently based on a cubit of 19·8 inches (*see* Table VII), but there seems no evidence as to whence this cubit is derived: it may be the parent of the Belgic foot (13·2 inches) which was used in England at one time ("Encyc. Brit.," W. and M.).

70,000 square inches = 264·6 inches square.
= 22·05 feet square.

(22 yards)$^2\frac{2}{9}$ = 69,696 square inches; 304 short of 70,000, about $\frac{1}{2}$ per cent.

$\frac{2}{3}$ of 70,000 square inches = 46,666 = $(216{\cdot}02)^2$.
= 18 feet square.
= 6 yards square (within $\frac{1}{5000}$).

Six yards square corresponds to 9 Ἐξαπόδης equal to 324 Grecian square feet, but it does not correspond to English square measure.

The English pounds Troy and avoirdupois appear to have been derived from different sources.

The pound Troy would appear to have the same relation to the cubic foot as the Roman pound has to the Roman cubic foot, and thus to have been derived from the Babylonian measures; but there is a difference of about 6 per cent. between the pound Troy as it is and as it should be by the test of 80 to a cubic foot of water.

	Ancient grains.	Ancient grains in ounce.
The Babylonian commercial mina, or pound, is 8,187 Imperial grains ..	7,200	600
The English pound should be 5,458 Imperial grains	4,800	400
The English pound actually is 5,760 Imperial grains	5,060	421

The pound avoirdupois, from its division into 16, may be the direct descendant of the hon. There are 320 hons to a cubic cubit, and there are 320 lbs. avoirdupois to a comb or 4 bushels which equal a cubic cubit (*see* Table IX).

There are 80 pounds to a bushel. The hon weighs 6,913 grains Imperial, so that the pound avoirdupois exceeds it by 87 grains, or about 1 per cent. (*see* Tables IV and IX).

The Hebrew kor (= 10 baths) is exactly half an English cubic yard. If the contents of a cubic yard are shaped in the form of a sphere and a cylinder enclose it, and a cone be erected on the base of the cylinder with the same height, the cone will represent exactly a kor, the sphere will represent a cubic yard, and the cylinder will represent an Egyptian chest, and their proportions respectively will be 1, 2, and 3.

ERRATA.

Chapters I to XIII.

P. 236, line 13, *for* "1,150" *read* "1,140."
,, ,, 17, *for* "901$\frac{5}{9}$" *read* "912·6."
,, ,, 19, *for* "6" *read* "15."
,, ,, 20, *for* "3 per 2,000" *read* "15 per 1,000."
P. 263, line 27, *for* "12 × 3·3" *read* "123·3."
,, ,, 36, *for* "176" *read* "141·7."

TABLE VIII.—*Comparison of Greek and Roman Measures of Capacity with the Hebrew.*

—	Cotyla.	Sextarius.	Congius.	Urna.	Amphora.	Metrêtês.	Smith's "Dict. of Greek and Roman Antiquities." Roman foot of 11·65 inches.	Deduced from Roman foot of 11·65 inches. 80 lbs. to cubic foot.	Solonian measures, Early Roman and Grecian systems.	Hebrew Measures (*see* Table V).
							Cubic inches.	Cubic inches.	Cubic inches.	
Hemina or Cotyla	1						—	—	—	
Sextarius or Xestes	2	1					33·28	33·0	32·4	Log.
Congius or Chous	12	6	1				199·67	198·0	194·0	½ hin.
Semimodius or Hemekton ..	16	8	$\frac{4}{3}$				266·24	264·0	—	8 logs.
Modius or Ektos	32	16	$\times\frac{4}{3}$				532·48	528·0	—	16 logs.
Urna	48	24	4	1			798·53	792·0	777·7	Seah.
Amphora Quadrantal, or Roman foot cube.	96	48	8	2	1		1,597·06	1,581·1	1,555·5	$\frac{3}{5}$ ancient cubic foot.
Metrêtês	144	72	12	3	$1\frac{1}{2}$	1	2,396·1	2,376·0	2,333·3	Bath.
Medimnus	192	96	16	4	2	$\frac{4}{3}$	—	—	—	4 seahs.
Culeus	1,920	960	160	40	20	$\frac{40}{3}$	—	—	—	40 seahs.
One cubic yard	—	—	—	—	30	20	—	—	—	2 kor.
One Egyptian chest	—	—	—	—	45	30	—	—	—	3 kor.
Roman pound in grains (Imperial)	—	—	—	—	—	—	4,988*	4,988	4,913	

* Smith's Dictionary gives both 5,053·2 and 4,988, the latter is at the rate of 80 lbs. to cubic foot.
252·6428 Imperial grains to a cubic inch of rain water.

TABLE IX.—*Egyptian Measures of Capacity.*

——		Kat.	Uten.	Hon.	Tima.	Apit.	Ram.	Cubic Palms.	Cubic Inches.	Inches Cube.	Imperial Grains.	Weight in Imperial grains, Madden's "Jewish Coinage," p. 277.
—	Kat ..	1						·0214	·54		138·76	140
—	Ro ..	6¼										
—	Uten ..	10	1					2·17	5·4		1,387·6	1,400
—	Hon ..	50	5	1				1·07	27·3	3	6,938·2	
—	Tima ..	100	10	2	1			2·14	54·7		13,876·4	
—	Honna ..	200	20	4	2			4·28	109·4			
Gallon ..	—	—	—	10	5			21·43	273·0	6½		
Del = Tovit	Apit ..	—	—	40	20	1		42·87	1,094·4	½ cubit.		
Bushel ..	—	—	—	80	40	2		85·75	2,188·8	13		
Strike ..	Ram ..	—	—	160	80	4	1	343·0	4,377·0			
Comb ..	—	—	—	320	160	8	2	343·0	8,755·0	cubit.		
Quarter ..	—	—	—	640	320	16	4	686·0	17,510·4	26		
Chest ..	—	—	—	2,560	1,280	64	16	2,744·0	70,041·6	2 cubits.		

TABLE X.—*Comparison of Weights.*

—	Ratio of content.	Cubit inches linear.	Foot inches linear.	Cubic foot, C.I.	Imperial Grains.			Cubic Inches.		Ancient Grains.		
					Talent or cubic foot.	Silver Mina.	Pound.	Mina.	Pound.	Talent or cubic foot.	Mina.	Pound.
Babylonian ..	30	20·6109	13·7406	2,592·5	655,000	10,916	8,187	43·2	32·4	576,000	9,600	7,200
Egyptian ..	—	—	—	2,197	555,056	9,250·9	6,938·2	36·6	27·45	488,166	8,135	6,101
Euboïc ..	25	19 36	12·926	2,160	545,833	9,095	6,821	36·0	27·0	480,000	8,000	6,000
Later Grecian	—	18·202	12·135	1,786	—	7,504	5,628	—	—	396,888·8	6,629	4,972
Early Grecian Modern English	20	18·0	12·0	1,728	436,666·6	7,277	5,458	28 8	21·6	384,000	6,400	4,800
Later Roman..	—	17·485	11·657	1,584	—	6,651·7	4,988·3	26·4	19·8	352,000	5,866	4,400
Early Roman.. Solonian ..	18	17·3787	11·5858	1,555·2	393,000	6,550	4,912	25·92	19·44	345,600	5,760	4,320
Euboïc (raised by decree).	—	19·92	13·28	2,347	—	9,885	—	—	—	—	—	—

TABLE XI.—*Comparison of Weights of Talents in Pounds Avoirdupois.* (*See* Table X.)

—	Now deduced.	Smith's "Dictionary of Greek and Roman Antiquities."	Smith's "Dictionary of Bible."	Madden.	"Handbook of Bible."	Variorum Bible, notes.
Hebrew gold and silver	93·57	—	94·28	94·28	166	130·0
Babylonian	93·57	95·00	—	68·50		108·0 96·3
Egypt	78·99	—	—	60·00	—	—
Euboïc raised	84·89	88·00	85·42	85·42	—	—
Euboïc	77·97	79·00	79·84	79·89	—	—
Late Grecian	64·32	—	—	—	—	—
Early Grecian	62·36	—	61·4	64·4	—	—
Late Roman	56·92	57·77	—	—	—	—
Solonian and early Roman	56·14	57·00	57·9	57·9	—	—
Euboïc	—	—	55·2	55·2	—	—
Persian	—	—	—	57·08	—	—

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT JERUSALEM IN THE YEAR 1898.

By James Glaisher, F.R.S.

The numbers in column 1 of this table show the highest reading of the barometer in each month; of these the highest, as usual, are in the winter, and the lowest in the summer months; the maximum for the year was 27·795 inches, in January, and the next in order 27·731 inches, in December. The highest reading in the preceding 37 years, viz., 1861 to 1897 inclusive, was 27·816 inches, in December, 1879, and the next in order was 27·800 inches, in November, 1870; and these are the only two readings in the preceding 37 years that are higher than the maximum for this year.

In column 2 the lowest reading of the barometer in each month is shown; the minimum for the year was 26·860 inches, in March, and the next in order 27·153 inches, in August. The lowest reading in the preceding 37 years was 26·970 inches, in March, 1896.

The numbers in the 3rd column show the extreme range of readings in each month; the smallest was 0·137 inch, in June, and the next in order 0·181 inch, in July; the largest was 0·625 inch, in January, and the next in order 0·575 inch, in March. The mean monthly range for the year was 0·352 inch. The mean for the preceding 37 years was 0·311 inch.

The range of barometer readings in the year was 0·935 inch; this very large range was mostly due to the low reading in March. The largest range in the preceding 37 years was 0·755 inch, in 1897; and the smallest 0·491 inch, in 1883.

The numbers in the 4th column show the mean monthly pressure of the atmosphere; the highest was 27·529 inches, in January, and the next in order 27·486 inches, in December; the lowest was 27·264 inches, in July, and the next in order 27·286 inches, in August. The mean yearly pressure was 27·386 inches. The highest mean yearly pressure in the preceding 37 years was 27·442 inches, in 1863; and the lowest, 27·357 inches, in 1894. The mean yearly pressure for the 37 years was 27·390 inches.

The temperature of the air reached 90° on June 1st, and there were seven other days in June when the temperature reached or exceeded 90°. In the preceding 16 years the earliest day in the year the temperature was 90° was March 25th in the year 1888; in July it reached or exceeded 90° on one day; in August on one day; in September on one day; and in October on one day, the 23rd; this being the last day in the year the temperature was 90°. In the preceding 16 years the latest day in the year this temperature reached 90° was October 23rd, 1887. The temperature reached or exceeded 90° on 12 days during the year. In the year 1897 the number of days of this high temperature was 16, and in 1887 was 73; the average for the 16 years was 37. The

highest temperature in the year was 98°·5, on June 19th ; the highest in the preceding 16 years, viz., 1882 to 1897, was 108°, in June, 1894.

The temperature of the year was as low or lower than 40° in January on 27 nights ; in February on 13 nights ; in March on 9 nights ; in April on 1 night ; and in December on 6 nights. Thus the temperature was as low or lower than 40° on 56 nights during the year. In the year 1892 the number of nights of this low temperature was 19, and in 1894 was 113 ; the average of the 16 years was 55. The lowest temperature in the year was 25° on January 1st. The lowest in the preceding 16 years was 25°, on December 31st, 1897.

The highest temperature of the air in each month is shown in column 5. In January it was 55°, and 5°·5 below the mean of the 16 high day temperatures in January. The high day temperature was also below its average in February, March, May, July, August, September, and October ; and above in the remaining months. The mean for the year was 82°·8, being 1°·0 below the average of 16 years.

The lowest temperature of the air in each month is shown in column 6. In January it was 25°, being the lowest in the year, and 6°·6 below the average of the 16 low night temperatures in January. The low night temperature was also below its average in February, April, and December ; and above in the remaining months. The mean for the year was 44°·6, being 0°·2 above the average of 16 years.

The range of temperature in each month is shown in column 7 ; the numbers vary from 30° in January to 47° in April. The mean range for the year was 38°·2, being 1°·2 less than the average of 16 years.

The range of temperature in the year was 73°·5. The largest in the preceding 16 years was 81°, in 1894 ; and the smallest, 63°·5, in the year 1885.

The mean of all the high day temperatures in each month is shown in column 8. The lowest was 46°·6, in January, being 4°·5 lower than the average. The highest was 84°·7, in July, being 3°·0 lower than the average. The mean for the year was 70°·9, or 1°·1 below the average of 16 years.

The mean of all the low night temperatures in each month is shown in column 9. The lowest was 35°·6, in January, being 2°·8 lower than the average ; the highest was 64°·6, in July, being 0°·2 higher than the average. The mean for the year was 53°·8, or 1°·4 above the average of 16 years.

In column 10 the mean daily range of temperature in each month is shown ; the smallest was 11°, in January, and the next in order 12°·2, in December ; the greatest was 21°·5, in September, and the next in order 21°·2, in June. The mean for the year was 17°·1, being 2°·5 less than the average. The smallest ranges in the preceding 16 years were 9°·3, in January, 1883, and 9°·4, in December, 1897 ; the greatest were 33°·8, in August, 1886, and 30°·1, in August, 1887. The smallest mean for the year was 16°·4, in 1897, and the greatest 24°·3, in 1886.

The mean temperature of the air, as found from the mean of the

maximum and minimum temperatures only, is shown in each month in column 11; the lowest was 41°·1, in January, and the next in order 47°·9, in February, and 49°·6, in December; the highest was 74°·6, in July, and the next in order 74°·0, in both June and October. The mean for the year was 62·4, being 0°·2 above the average of 16 years. The lowest mean temperatures in the preceding 16 years were 39°·8, in January, 1890, and 42°·3, in January, 1894; the highest were 81°·2, in August, 1890, and 81°·1, in July, 1888. The highest mean for the year was 63°·5, in 1892, and the lowest 60°, in 1894. January was the coldest month of the year, and was below its average both by day and night.

The numbers in column 12 are the mean readings of a dry-bulb thermometer. If those in column 12 be compared with those in column 11 it will be seen that those in column 12 are a little higher in every month, the difference of the means for the year being 2°·0; the mean difference between the mean temperature of the air and that at 9 a.m. for the 16 years was 3°·3.

For a few days in the winter months the dry and wet-bulb thermometers read alike, or nearly so, but in the months of April, May, June, September, and October the difference between the readings often exceeded 15°, and was as large as 24° on June 14th.

In column 13 the mean monthly readings of the wet-bulb are shown; the smallest differences between these and those of the dry-bulb were 3°·1 in January, and 3°·9 in December; the largest were 13°·6 in October, and 12°·3 in May. The mean for the year was 56°·6, and that of the dry-bulb 64°·4.

The numbers in column 14 are the mean temperature of the dew-point, or that temperature at which the air would be saturated by the quantity of vapour mixed with it; the smallest difference between these numbers and those in column 12 were 6°·9, in January, and 8°·3 in December; and the largest were 23°·1, in October, and 21°·7 in May. The mean temperature of the dew-point was 50°·2; the mean for the 16 years was 50°·1.

The numbers in column 15 show the elastic force of vapour, or the length of a column of mercury in inches corresponding to the pressure of vapour; the smallest was 0·209 inch, in January; and the largest 0·616 inch, in July. The mean for the year was 0·381 inch; the average of the 16 years was 0·375 inch.

In column 16 the weight in grains of the water present in a cubic foot of air is shown; it was as small as 2·4 grains in January, and as large as 6·6 grains in July. The mean for the year was 4·2 grains; the average of the 16 years was 4·1 grains.

In column 17 the additional quantity of water required to saturate a cubic foot of air is shown; it was as small as 0·7 grain in January, and as large as 5·5 grains in October. The mean for the year was 2·9 grains; the average of the 16 years was 3·3 grains.

The numbers in column 18 show the degree of humidity, saturation being represented by 100; the largest numbers appear in January and

December, and the smallest in April, May, and October; the smallest of all is 45 in October. The mean for the year was 61; that of the 16 years was 59.

The numbers in column 19 show the weight in grains of a cubic foot of air, under its mean atmospheric pressure, temperature and humidity. The largest number was 508 grains in January, and the smallest 468 grains in July. The mean for the year was 484 grains; that of the 16 years was 482 grains.

The most prevalent winds in January were E., S.W., and W., and the least prevalent wind was S.E.; the most prevalent in February were N.E. and W., and the least were N., S.E., and S.; the most prevalent in March were N.W. and W., and the least was S.E.; the most prevalent in April were N.E., W., and N.W., and the least were S. and S.W.; the most prevalent in May was N.W., and the least was S.; the most prevalent in June were N.W., N., and N.E., and the least were S. and S.W.; the most prevalent in July were N.W. and W., and the least were N.E., E., and S.E.; the most prevalent in August were W. and N.W., and the least were N.E., E., S.E., S., and S.W.; the most prevalent in September was N.W., and the least were S.E. and S.; the most prevalent in October were N.W. and E., and the least were S.E. and S.W.; the most prevalent in November were N.E., E., and N.W., and the least were N. and S.; and the most prevalent in December was N.E., and the least were N. and S.E. The most prevalent wind in the year was N.W., which occurred on 106 times, of which 17 were in July, 16 in September, and 13 in August; and the least prevalent wind was S., which occurred on only 8 times during the year, of which 2 were in both January and October, and 1 in each of the months of March, May, June, and December.

The total number of times of each wind are shown in the last line of columns 20 to 27; those winds less in number than the average of the preceding 16 years were :—

N.	by	7
S.E.	,,	13
S.	,,	1
S.W.	,,	17
N.W.	,,	11

and those winds greater in number than the average of 16 years were :—

N.E.	by	18
E.	,,	21
W.	,,	10

The numbers in column 28 show the mean amount of cloud in each month; the month with the smallest amount is September, and the largest March. Of the cumulus or fine weather cloud, there were 4 instances; of the nimbus or rain cloud 31 instances, of which 9 were in March and 6 in January; of the cirrus there were 4 instances; of the stratus 3 instances; of the cirro cumulus 60 instances; of the cumulus stratus 47 instances; of the cirro stratus 28 instances; and 188 instances

of cloudless skies, of which 26 were in September, 24 in October, and 23 in both June and July, and only 4 in March.

The largest fall of rain for the month in the year was 7·29 inches, in March, of which 2·50 inches fell on the 20th and 1·33 inch on the 10th. The next largest fall for the month was 6·60 inches, in December, of which 2·53 inches fell on the 26th, 1·97 inch on the 25th, and 1·18 inch on the 15th. No rain fell from April 9th till November 3rd, making a period of 207 consecutive days without rain. The total fall of rain for the year was 28·66 inches, being 2·42 inches above the average of 37 years, viz., 1861 to 1897. The number of days on which rain fell was 59, being 3 more than the average.

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT TIBERIAS IN THE YEAR 1898.

By James Glaisher, F.R.S.

The numbers in column 1 of this table show the highest reading of the barometer in each month; the highest appear in the winter, and the lowest in the summer months; the maximum for the year was 31·214 inches, in January, and the next in order 31·103 inches, in December.

In column 2 the lowest reading in each month is shown; the minimum for the year was 30·126 inches, in March, and the next in order 30·192 inches, in August.

The range of readings in the year was 1·088 inch, being 0·153 inch greater than the range at Jerusalem; both the maximum and minimum readings of the barometer at Tiberias occurred in the morning observations.

The numbers in the 3rd column show the extreme range of readings in each month; the smallest was 0·309 inch, in June, and the next in order 0·350 inch, in August; the largest was 0·800 inch, in January, and the next in order 0·686 inch, in December.

The numbers in columns 4 and 5 show the mean monthly reading of the barometer at 8 a.m. and 4 p.m., and those in column 6 the lower reading at 4 p.m. than at 8 p.m.; the smallest difference between these two readings was 0·051 inch, in March, and the next in order 0·062 inch, in February; the largest was 0·163 inch, in October, and the next in order 0·098 inch, in July. In England, in January, the readings at 8 a.m. and 4 p.m. are practically the same; in all other months the reading at 4 p.m. is lower than at 8 a.m.; the greatest difference is 0·025 inch, in June. The mean for the year at Tiberias was 0·082 inch, being about four times greater than in England.

The numbers in the 7th column show the mean monthly pressure of the atmosphere; the highest was 30·896 inches, in January, and the next in order 30·784 inches, in December; the lowest was 30·360 inches,

in July, and the next in order 30·393 inches, in August. The mean for the year was 30·591 inches.

The highest temperature of the air in each month is shown in column 8. The first day in the year the temperature reached 90° was on April 3rd, and there were 7 other days in April on which the temperature reached or exceeded 90° ; in May, on 14 days ; in June, on 22 days ; in July, August, and September it reached or exceeded 90° on every day ; in October, on 21 days ; and in November, on 6 days ; thus the temperature reached or exceeded 90° on 163 days during the year. At Jerusalem the temperature did not reach 90° till June 1st, and there were only 12 days in the year on which the temperature was as high as 90°. At Tiberias the temperature was 101° on June 12th, and reached or exceeded 100° on 10 other days in this month ; in July, on 11 days ; in August, on 6 days ; in September, on 1 day ; and in October, on 7 days ; thus on 36 days in the year the temperature reached or exceeded 100°. The highest temperature in the year at Tiberias was 109°, on both June 18th and September 10th ; at Jerusalem it was 98°·5, on June 19th.

The minimum readings of the thermometer were not trustworthy, and consequently columns 9, 10, 12, and 13 are blank. On p. 73 of the *Quarterly Statement* for January, 1899, the difference between the mean temperature of the air in every month at 8 a.m., and the simple mean of the maximum and minimum temperature (used as mean temperature), was found from seven years observations—1890–1896—as follows :—

In January	to the mean of observations at 8 a.m.	add	1°·1
February	,, ,,	,,	0°·1
March	,, ,,	subtract	0°·6
April	,, ,,	(no correction).	
May	,, ,,	add	0°·7
June	,, ,,	,,	1°·1
July	,, ,,	,,	0°·6
August	,, ,,	,,	1°·3
September	,, ,,	subtract	0°·2
October	,, ,,	add	0°·2
November	,, ,,	,,	1°·0
December	,, ,,	,,	0°·7

By the application of these numbers to those in column 15 the numbers in column 14 have been found, showing the approximate mean temperature of each month.

In column 11 the mean of all the high day temperatures in each month is shown. The lowest was 59°·1, in January, being 12°·5 higher than that at Jerusalem, the next in order were 68°·5, in February, and 68°·7, in December ; the highest was 99°·1, in July, and the next in order were 97°·9, in August, and 95°·7, in June. At Jerusalem the lowest were 46°·6 in January, 54°·1 in February, and 55°·7 in December ; the highest were 84°·7 in July, 84°·6 in June, and 83°·7 in August.

The mean temperature of the air in each month is shown in column 14.

The lowest was 53°·5, in January, the next in order were 59°·6, in February, and 61°·6, in December; the highest was 87°·8, in both July and August, and the next in order were 85°·6, in June, and 85°·1, in October. At Jerusalem the lowest temperatures were 41°·1 in January, 47°·9 in February, and 49°·6 in December; the highest were 74°·6 in July, 74°·0 in June and October, and 73°·3 in August. At Tiberias the mean temperature increased month by month to the maximum in both July and August, decreased in September, increased in October, then decreased again to the end of the year. At Jerusalem the mean temperature increased month by month to the maximum in July, then decreased in August and September, increased in October, and then decreased again to the end of the year. At Tiberias the yearly value was 74°·5; at Jerusalem it was 62°·4.

The numbers in the 15th and 16th columns are the mean readings of a dry and wet-bulb thermometer, taken daily at 8 a.m. The mean for the year of column 15 was 74°·0, being 0°·5 less than the inferred mean of column 14. In the year 1890 the dry-bulb was 1°·1 lower than that of the maximum and minimum thermometers; in 1891 it was 1°·5 lower; in 1892, 0°·4 higher; in 1893, 0°·7 lower; in 1894, 0°·5 lower; and in 1895, 0°·1 lower; the mean of the six differences is 0°·6; and therefore the mean temperature of the year may be approximately determined by a single reading of the thermometer taken daily at 8 a.m.

The numbers in the 17th column are the temperature of the dew-point, or that temperature at which the air would be saturated by the quantity of vapour mixed with it; the smallest difference between these numbers and those in column 15 was 8°·0 in December, and the largest 21°·7 in October.

The numbers in column 18 show the elastic force of vapour, or the length of a column of mercury in inches corresponding to the pressure of vapour; the smallest was 0·261 inch, in January; and the largest 0·811 inch, in July.

In column 19 the weight in grains of the water in a cubic foot of air is shown; it was as small as 2·9 grains in January, and as large as 8·5 grains in July.

In column 20 the additional quantity of vapour required to saturate a cubic foot of air is shown; it was as small as 1·5 grains in both January and December, and as large as 6·6 grains in October.

The numbers in column 21 show the degree of humidity of the air, saturation being represented by 100; the largest number is 75 in December, and the smallest 48 in October.

The numbers in column 22 show the weight in grains of a cubic foot of air, under the mean atmospheric pressure, temperature, and humidity of the air; the largest number was in January, decreasing to the smallest in July, then increasing again to the end of the year.

In columns 23 and 24 are the mean readings of a dry and wet-bulb thermometer taken daily at 4 p.m. By comparing the numbers in column 15 with those in column 23, the increase of temperature from

8 a.m. to 4 p.m. is shown; in November the increase was only 1°·6, and in June it was as much as 7°·6.

In column 25 the temperature of the dew-point at 4 p.m. is shown. By comparing these numbers with those in column 17, it will be seen that the temperature of the dew-point in the months of January, February, March, October, and November was higher than at 8 a.m., and lower than at 8 a.m. in all other months. The numbers in this column are smaller than those in column 23 by 9°·5 in January, increasing to 29°·5 in June, then decreasing to 11°·8 in November; these differences between the temperature of the air and that of the dew-point are very much larger than those at 8 a.m., being in several months more than twice as large.

On several days during the months of April, May, June, July, September, and October at 4 p.m., the reading of the dry-bulb thermometer exceeded that of the wet by 20° or more, and the temperature of the dew-point was from 32°·2 to 54°·3 lower than the temperature of the air, as shown by the table on the following page.

In column 26 the elastic force of vapour is shown, and by comparing the values with those in the same month at 8 a.m., we find that it was smaller at 4 p.m. in the months of April, May, June, July, August, September, and December, and larger than at 8 a.m. in the remaining months.

In column 27 the amount of water in a cubic foot of air at 4 p.m. is shown; the amount was less than at 8 a.m. in the months from April to September, and in December, of the same value in October, and larger than at 8 a.m. in the remaining months.

In column 28 the amount of water required to saturate a cubic foot of air was as large as 9·8 grains in June, and as small as 1·4 grain in January.

In column 29 the degree of humidity is shown; the driest months are from April to October, the value for these months varying from 37 in June to 45 in April.

In column 30 the weight of a cubic foot of air is shown; the smallest was 505 grains in July, and the largest 554 grains in January.

In column 31 are given the number of days of rain in each month; the greatest number was 8 in each of the months of March, November, and December. The total number in the year was 37. At Jerusalem rain fell on 59 days.

In column 32 the monthly fall of rain is given. The heaviest fall of rain on one day in the months from January to March was 1·16 inch, on February 13th, and the next in order were 0·77 inch, on January 25th, and 0·75 inch, on January 15th. No rain fell from March 19th till October 12th, making a period of 206 consecutive days without rain. The fall of rain on December 13th was 1·45 inch, and on the 14th 1·55 inch fell. The heaviest monthly fall in the year was 4·28 inches, in December, and the next in order 3·22 inches, in February. The total fall for the year was 15 inches. At Jerusalem the total fall for the year was 28·66 inches.

Month and Day.	Reading of		Temperature of the Dew-Point.	Temperature of the Dew-Point below Dry.
	Dry.	Wet.		
	°	°	°	°
April 3	91·0	71·0	58·6	32·4
4	93·0	73·0	60·8	32·2
20	91·0	66·0	50·5	40·5
21	93·0	73·0	60·8	32·2
May 5	85·0	65·0	51·9	33·1
6	85·0	64·0	50·2	34·8
7	85·0	65·0	51·9	33·1
10	91·0	68·0	53·7	37·3
16	92·0	66·0	49·9	42·1
17	91·0	67·0	52·1	38·9
22	94·0	68·0	52·4	41·6
29	91·0	68·0	53·7	37·3
31	93·0	70·0	56·0	37·0
June 1	91·0	70·0	57·5	33·5
10	97·0	75·0	62·1	34·9
11	96·0	74·0	61·0	35·0
12	100·0	77·0	63·9	36·1
13	103·0	74·0	57·8	45·2
18	105·0	80·0	66·2	38·8
21	97·0	75·0	62·1	34·9
28	99·0	77·0	64·3	34·7
29	102·0	79·0	66·1	35·9
30	99·0	77 0	64·3	34·7
July 9	99·0	78·0	65·9	33·1
10	100·0	79·0	67·0	33·0
Sept. 10	94·0	73·0	60·3	33·7
11	105·0	71·0	50·7	54·3
21	93·0	72·0	59·2	33·8
23	93·0	72·0	59·2	33·8
Oct. 19	90·0	70 0	57·5	32·5
21	92·0	71·0	58·1	33·9
22	95·0	70·0	55·0	40·0
23	95·0	74·0	61·4	33·6
24	97·0	73·0	58·8	38·2
25	95·0	70·0	55·0	40·0
26	94·0	72·0	58·7	35·3
27	96·0	71·0	56·2	39·8
28	97·0	73·0	58·8	38·2
31	94·0	72·0	58·7	35·3