

and recrossing, and is nowhere more than 30 seconds of arc apart, except in one spot, where I have shown a loop of 1 minute to east. Whereas the Jordan as surveyed by Lieutenant Lynch, varies in distance from 1 minute to 6 minutes of arc to east of Jordan on Palestine Exploration Fund plan. I should state that I did not sketch the minor twists of the Jordan themselves, but accepted those of Lieutenant Lynch, only altering the general positions from 1 to 5 miles to west.

I find that in carrying the work on from Jaffa to Kurn Surtabeh, I have an error of 30 seconds of arc in about 43 minutes of arc, but at Jerusalem I had an error of only 11 seconds in 30 minutes.

Taking 10 seconds as the limit of error in these astronomical calculations, I would propose from these and other data, that my mean error in carrying the longitude eastward from Jaffa is 15 seconds in 30 minutes of arc, or 1 in 120.

Now, my most easterly point is near 'Amman, about $1^{\circ}15'$ east of Jaffa, and I should suppose therefore that my utmost error there would amount to $37\frac{1}{2}$ seconds of arc plus 10 seconds limit of error.

Having arrived at this conclusion, I can apply a constant correction for each observation for longitude, and thus hope nearly to eliminate this error and obtain both the latitude and longitude of the principal points east of the Jordan in Gilead and Moab, to within a limit of 20 seconds of arc, or 600 yards on the earth surface.

Twenty seconds of arc of longitude in this latitude measures about one-fifth of an inch, roughly speaking, on plan.

In this reconnaissance I surveyed about 1,400 square miles in 28 days, including special surveys of Aman, Jerash, Nebo, and other ruins, besides examining sites and arranging for taking about 50 photographs.

At this rate 15,000 square miles could be surveyed in 12 months, on a scale half-inch to the mile, with a prospect of the limit of error not exceeding one-fifth of an inch on plan, from one end of the survey to the other.

I have to suggest that this is the system which should be adopted for the south country below Beer sheba from Gaza to Rhinocolura, round to Petra.

It would cost about £3,000.

I was the first to advocate a detailed trigonometrical survey for Palestine proper, on account of the mass of biblical sites so close together, but in the south country such detailed accuracy is not requisite; a detailed survey would be out of place, it would occupy about 10 years, and cost about £25,000.

CHARLES WARREN.

NOTES ON DISPUTED POINTS.

The Calves of Bethel.—Mr. Birch's paper on this subject has caused me to reconsider the views on the question put forward in the Quarterly State-

ment 1878, p. 28. There is no doubt that the Crusaders thought that the Calves erected at Dan and Bethel stood on the ridges of Ebal and Gerizim, and there is no doubt that the site of Luz or Bethel was shown by the Samaritans on Gerizim from a very early period; for it is mentioned by Eusebius and other writers of the fourth century. The removal of Bethel to Gerizim is very probably as old as the time of Sanballat, when the Samaritan Temple was built, but a careful study of the various Biblical passages seems to show that no trace of the heretical Bethel can be certainly discovered in the Old Testament.

Moriah.—The dispute as to whether the Jewish or the Samaritan site of Moriah is the true one is very ancient. It must be remembered that in Chronicles Moriah is identified with the Temple Hill (2 Chronicles iii, 1); on the other hand that hill is not visible from off the road from Beersheba until within a distance of half-a-mile, because the ridge of *Abu Thor* is 100 feet higher than the Temple Hill. As to the distance, Beersheba may be easily reached from Jerusalem in two days, while Gerizim is visible *afar off* from the Maritime plain within about 50 miles of Beersheba. From the experience of the Survey marches I am able to say that a Syrian ass can march 20 miles in a day for several days, as we always had donkeys with us on our longest journeys.

Rock Rimmon.—I still feel unable to accept Mr. Birch's proposed site for the Rock Rimmon as connected with the cave Mughâret el Jai. The Biblical account is not sufficiently detailed to allow of much being based on it and Josephus gives nothing further to assist us; but in addition to objections previously stated I would urge that the cave in question is only *a mile and a half* from Gibeah of Benjamin, and it seems highly improbable that the remnant of the defeated Benjamites would have been able to find refuge so close to the scene of the battle. The Rock of Rummôn is 5 miles from Jeba' and separated by most difficult country.

If the word *Sela* mean "high" as Gesenius renders it, then Rummôn suits well, being on a most conspicuous hill (300 feet above Jeba'), but if it should be applied simply to precipices—as Mr. Birch urges with considerable force—then the site is again appropriate, standing as it does above the precipices of the rugged *Wâdy el 'Asâs*. The word *Rummôn* is not Arabic, but evidently the Hebrew Rimmon which—it may be noted in passing—probably means "lofty," in allusion to the site of the village, and has nothing to do with a pomegranate (Arabic *Rammân*).

Adullam.—I presume that as Mr. Birch has given his adhesion to the traditional site of this cave he will be able to furnish some argument in support of its claims. I am not aware at present that there is any sound reason for identifying the Cave of Adullam with the present *Mughâret Khûreitan*. The theory first appears in William of Tyre's works, no reason being assigned. The modern name is derived from the proximity of a ruined monastery of Saint Chariton. The name *Mughâret M'asa*, also applied to the same caves, would signify in Arabic "the intricate cave" which applies very well to the innumerable

passages and halls surveyed by the R.E.s in 1874. The explanation "cave of refuge" seems open to objection, and the word *Meis*, which Mr. Birch connects with *Masa*, is the name of a well known tree.

Mr. Birch identifies the "hold" (1 Samuel xxii, 5, 1 Chronicles xi, 16) with the Cave, but the word is *Metzed* "a mountain Castle") applied to the "Stronghold of Sion" (2 Samuel v, 7, &c.), which was not a cave. Josephus says that the Cave was at the City of Adullam (Ant. vi, 12, 3) and there seems no reason to suppose that David's band of 400 men lived in the cave with him. They may properly, it seems to me, be considered to have garrisoned the "hold" or fortress, that is the City of Adullam on its strong hill, close to or even within which was the cave described in "Tent Work" (vol. ii, p. 159).

As to the position of the *City of Adullam* there is I think no dispute. The situation of 'Aid el Ma corresponds exactly with the Adullam of the Onomasticon, and the name is radically preserved. The position agrees also with the accepted identifications of Socoh Jarmuth, Zoreah and Eshtaol and other places mentioned in the Adullam group (Josh. xv. 35). It is also noticeable that David is spoken of whilst in the hold of Adullam as not being in the territory of Judah (1 Sam. xxii, 5). This agrees with the position of Adullam in the Shephelah beyond the mountains to which Judah was confined when the Philistines were too powerful for the Jews.

Naarath.—Mr. Birch quotes a paper (Quarterly Statement 1877, p. 44) by Mr. Kerr as proving Naarath to have been on the north boundary of Ephraim. He seems, however, scarcely to have followed the meaning of the writer. Mr. Kerr points out nearly the same position for Naarath which I had previously advocated, and uses the same arguments. The accepted identifications of Janohah and Taanath Shiloh preclude the possibility of placing Naarath much farther north than the site proposed in the "Handbook to the Bible" and the aqueduct still existing, with the distance given for Nearah from Jericho by Eusebius, seem to afford strong indications in favour of the identification with Khurbet el Auja which I proposed some years since.

24th April, '80.

C. R. C.

HIRAM, KING OF TYRE.

(From the "Athenæum," April 17, 1880. By permission of the Proprietors).

SOME years ago M. E. Renan, in one of his lectures at the Collège de France, that have contributed so much to the progress of Semitic epigraphy, exhibited and explained before his audience a copy of a Phœnician inscription originated in Cyprus. The copy—imperfect and fragmentary, made, it appears, by an inhabitant of Cyprus whose name is unknown—had been found, if I remember rightly, among the papers left by a German scholar,