

the same measures, as obtained from the Pyramid by Professor Petrie. Having regard to the care bestowed upon the subject by him, there can be little doubt that the actual measures are as accurate as could be obtained.

It will be seen, by an examination of the table, that the results obtained by taking the base as having a side of 6078·08, are, on the whole, rather nearer to Petrie's measurements than are those derived from a base of 6068·8 as given by him, but it would not be safe to conclude therefore that his base value is too small, as the differences in the values are so trifling that they might be due to errors in construction.

If the architect of the Pyramid had laid out the construction geometrically in the manner indicated above, it would evidently have been necessary for him to have had a smooth, level surface of considerable area to work upon. Such a surface existed on the east side of the Pyramid in the great basalt pavement, which was nearly 180 feet in length and covered more than a third of an acre. It seems to me probable that this pavement formed a gigantic drawing board, upon which the architect laid out the lines of construction of the Pyramid. The angular measurements were most probably laid out by means of the azimuth trenches, the axes of which meet on the west side of the pavement, while the angles of the Pyramid were worked out to full size in the trial passages, which lie to the north of the basalt pavement.

The basalt pavement would also probably have been used as the workshop for fitting together the masonry of the chambers and passages before these were hoisted into their proper places in the Pyramid. The casing stones, too, may have been cut to the proper angles and fitted together on the pavement, the position of which, at the end of the great causeway by which the stones were brought from the Turah quarries, was very conveniently situated for the purpose.

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NOTES ON THE JORDAN VALLEY AND PETRA.¹

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1. THE paper discusses some of the geological features of the Jordan valley, and the connection between the Dead Sea and the Gulf of Akabah.

There seems to be less evidence of a fault with a subsidence upon its eastern side than was supposed. There was, however, undoubtedly a rift valley or fracture, which was widened at a later period. This valley extended from the foot of Mount Hermon southward.

Abstracts of papers read before the British Association Meeting at Belfast, 1902. (Section E.)

The evidence of ice action on the southern slopes of Mount Hermon is very marked. This is not found upon the surface, where abrasion has probably removed all traces of it, but in places where the rocks have been covered up by moraines, which latter have but recently been removed.

From the northern end of this valley, throughout its whole extent, its structure is strongly suggestive of that of a fjord where the ice has been absent for a very long period.

A possible conception of the valley and its mode of formation might be that some time at the close of the cretaceous period this rift was formed. It was then widened and deepened by ice action, at least as far south as the Sea of Galilee, if not throughout its whole length.

After this the surrounding region was submerged by a depression of its surface, due to lateral pressure from the westward. It was at this time that the immense deposits of sandstone took place which were laid down in the valley nearly as far north as the Sea of Galilee. The thickness of these sedimentary deposits was about 4,000 feet, and their character varied, dependent upon the source of the material which was laid down.

Subsequent to this a gradual elevation of the layers took place, and as long as the supply of water was abundant the stream cut its way down through the sandstone, leaving fringe-like remnants on both sides of the valley, as well as an underlying mass in its bed. The protected lateral bays or alcoves on the sides of the main rift were found to be occupied by such deposits. The Lisân Peninsula might be regarded as a more resistant remnant than usual in the bed of the valley.

After this process had continued for a period long enough to bring about the removal of some 3,000 feet of this deposit, a change in the conditions took place, and one of three things happened, possibly all three :—

1. The glacier disappeared.
2. The water-supply failed to a considerable extent.
3. The rate of elevation increased.

Then the course of the water over the top of this sandstone "plug" first became sluggish and finally stopped, thus breaking the connection with the ocean.

From this time onward, while elevation to the extent of about one thousand feet took place, erosion upon this sandstone bed appeared in two directions—northward and southward—and a harder layer than usual, about the middle of the trough connecting the Dead Sea and the Gulf of Akabah, eventually became the turning-point of the waters in both directions.

This process is also illustrated in a similar remnant lying between the Jebel Usdum and the western face of the main limestone walls of the valley throughout the whole length of that peculiar range.

2. Petra is located in one of the larger bays or alcove valleys on the eastern side of the valley connecting the Dead Sea with the Gulf of Akabah. The depth of this bay inland must have been about seven miles.

The immense amount of sandstone here laid down was apparently affected by surface erosion only, as it was withdrawn from the active scouring action which was going on in the main valley to the westward. It therefore rose or was lifted up some 3,000 feet above that valley, while the limestone cliffs, its eastern shore line, still towered above it to the height of 3,000 feet more.

As you look down upon it from the old Roman road on the top of these cliffs, it appears like a tumbled sea of sandstone waves, so rough is its surface.

There is one channel, however, which has persisted in cutting its way down through this sandstone mass from the lower edge of the limestone plateau to a central depression with precipitous walls. This was the entrance to the location of the famous ancient city.

The stream occupying this cleft, after passing through the central valley, plunges headlong down a splendid canyon, through several thousand feet of sandstone to the valley of the Arabah, which lies some five or six miles distant. This latter portion of the Sîk is all but impassable; the upper portion, leading to the site of the city, is easily traversed, in fact it once had a Roman road leading along its winding bottom.

The position of this "Rock City" forms a marked contrast to other "strong places" of Moab, which were usually walled hilltops. It required no less military genius to grasp the elements of its strength and use them as a defence. The sturdy Roman was probably the only invader who became its foreign master, and he succeeded more by craft than by the force of arms.

The strange juxtaposition of its temples and amphitheatre to the thousands of tombs which surrounded them produces a curious impression upon the mind. It seems odd to us that their games and joyous festivals should be celebrated in full view of the solemn porticoes of the last resting-places of their ancestors.

The splendid structures carved in the walls of rock which surrounded their city have resisted the "tooth of time" very remarkably for 1,500 years, considering the soft material in which they are found. The city proper, with the exception of a single temple and part of an arch of triumph, have literally crumbled into dust.

Views of canyon entrance to the city, the chief Latin monuments, the still older Moabite "high places," as well as some pictures taken from Aaron's tomb on Mount Hor, were shown.
