

PHILÆ: THE NUBIAN VALLEY AND THE MODIFIED  
NILE RESERVOIR.<sup>1</sup>

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Last year the battle of the Reservoirs was hotly waged and I had the honour of reading a paper on the subject before the Institute.

In common with many other societies we raised our voices and we may congratulate ourselves that our efforts have not been in vain.

It will not, I hope, be without interest to the members of the Institute if I now state the result of our enterprise, and this I am the better able to do as, at the request of the Egyptian Ministry of Public Works, I have, with others, paid a visit to the island of Philæ as a member of a commission to see the marks set upon the buildings showing how far under the modified conditions of the reservoir these will be submerged, and to advise upon the best way of fortifying the structures where necessary. I will begin by quoting from an official document which is of the greatest importance to us and was published in the *Times* of November 19th, 1894. It runs as follows :

“The Ministry, recognising the respect due to the reasons advanced has endeavoured to reconcile the material interests of the country with those of science by submitting a modified scheme which has received the approval of the Government. This modified scheme consists in the construction of a dam at Assouan having its crest at the reduced level of 106 metres, that is to say 8 metres or 26 feet lower than that at first proposed. This will retain water sufficient for Middle or Lower Egypt, but not for both. It entails the submerision of only a part of Philæ Island containing the smaller monuments which could be protected by special works, to be planned in accordance with the wishes of the learned societies and it leaves the other numerous Nubian monuments untouched. In order to minimize still further any possible loss to science from the construction of such a vast reservoir, topographical surveys will be made this winter in order to fix the true bearings of the Nubian monuments and preliminary plans will be executed of all sites.”

<sup>1</sup> Read at the Monthly Meeting of the Institute, July 3rd, 1895.

Technical details are given with which I need not trouble you, but by this official announcement we learn that it is the very earnest wish of the Egyptian Government to respect its ancient monuments in all possible ways.

You will perhaps remember that by the scheme as at first proposed, a great wall was to be built across the Nile at a considerable distance below the island of Philæ (and being between Philæ and Assouan this dam is called the Assouan dam to distinguish it from other schemes for walls either touching the island of Philæ or south of it).

This great wall was to retain the water to so great a height that the whole of the island of Philæ with everything on it would have been completely submerged, only the upper parts of the pylons and of some of the highest buildings standing out above the surface. But not only would the island and buildings be submerged, but a stupendous reservoir more than 100 miles in length would have been formed, and this reservoir would have swamped the greater part of the cultivated ground, of the villages, and of the ancient monuments which lie along the side of the Nile from Philæ to Korosko.

By lowering the level of the reservoir 26 feet, the valley, except in the immediate neighbourhood of Philæ escapes the water, the villages and cultivated ground are left untouched. Many thousands of the people, who would have been dislodged are left to the enjoyment of their houses and the monuments are preserved from the destruction which must certainly have befallen most of them, as they stand, not upon rock, but in most cases upon soil which would have yielded to the action of the water.

The Ministry of Public Works having recommended the Egyptian Government to adopt the modified scheme levels were taken in the course of last winter showing very exactly how much of the island of Philæ and of the buildings upon it would be submerged and how much would stand free, and in February last in company with Mr. W. E. Garstin, C.M.G., the Under Secretary of State in the Egyptian Ministry of Public Works, we were invited to make our inspection and to state our views

with regard to the result upon the buildings and upon the best means of maintaining and protecting those which would still be submerged. It will be well to state, first, how much of the island will be submerged, second, what effect the submergence is likely to have, and third, what steps it is proposed to take to counteract their effect where ill results are to be feared.

The island, a mass of granite rocks and boulders, is considerably longer from north to south than it is wide from east to west. 420 yards by 150 according to Baedeker. It is stated to cover an area about equal that of St. James's Park; this may or may not be very accurate. On the highest parts of the centre stands the Temple of Isis, with its pylons towards the south, and in front of these, closed in on the south by larger pylons is a forecourt with buildings on the east and west. The building on the west is a very complete little temple in itself surrounded by a peristyle. It is the birth house or Meshen.

The buildings on the east side of the forecourt consist of a series of rooms fronted by a colonnade.

South of the large pylons extend two long colonnades which converge as they approach the southern extremity of the island, and, at this extremity, hanging right above the river, is the little Temple of Nectanebo II., the oldest structure so far as we yet know on the island.

On the eastern edge of the island stands the kiosque, or Pharaoh's Bed as it is often called. Other remains of no little interest are scattered about.

A quay wall many feet in height encloses nearly all the island and is generally in good preservation. The Temple of Isis, the most important feature of the group, retains its roof of huge stone slabs almost entire. The birth house to the west of the forecourt has also its roof quite perfect, whilst the chambers to the east are partly roofed.

Attention is called to the buildings that are roofed, as it is manifest that the water entering them must place them under no little danger, the sun not having access to dry out the damp from the walls.

By the modification now decided upon, the highest level to which the water in the reservoir can rise will

leave the floor of the Temple of Isis quite out of the water, but the floors of the forecourt and of the adjoining buildings will for a short time stand in water.

The ground towards the south sinks slightly, and the colonnades standing on it will consequently not altogether escape, whilst the little Temple of Nectanebo will be submerged to more than half way up the columns.

Behind, *i.e.*, north of the Temple of Isis stand the remains of a Coptic church built of stones taken from Egyptian temples. This church lies in a hole and will suffer probably more than any other stone built structure on the island. Beyond this and a little east standing on the edge of the island is a small arch considerably ruined. This too will have a good deal of water about it, but is fortunately of solid construction.

In addition to the stone buildings there are very many remains of crude brick structures.

The most important of these is the thick wall built in undulating courses, which enclosed the Temple of Isis and the forecourt. The lowest courses of this can be traced in many places, and in parts the wall is of considerable height and great solidity.

In addition to this there are remains of numerous brick built houses and other buildings. Some of these I feel no doubt formed part of the houses of the priests of the ancient worship; others are Coptic, for the island was a great Coptic stronghold, and others belong to later dates. The island was inhabited until recently and consequently houses have been built, altered, ruined and set up again for many hundreds of years. Beneath the accumulated rubbish of the more recent houses there is doubtless very much of early Coptic and even of Egyptian foundation.

To recapitulate. We have in the middle the Temple of Isis, which will now stand quite free from any inundation. We have the forecourt, which will have for a short time a little water in it. We have the colonnades, and most unfortunate of all because in the worst state of repair, the little structure of Nectanebo, which will be considerably immersed; we have the kiosk, the Coptic church and the little triumphal arch, each of which will for a time stand in water, and lastly, we have the brick

remains which will beyond doubt be resolved into the Nile earth of which they were originally made.

Having stated how much will be submerged the second point is, what effect the submergence is likely to have both on the stability of the structures and on the artistic charm of the island, the latter by no means a matter of small importance.

The temples, quay walls, etc., are all built of Nubian sandstone. The island itself is formed, as has been already said, of granite rocks and boulders. These form a solid and immovable foundation, and nearly, if not quite all of the buildings seem to be upon the solid.

We will first speak of the behaviour of the sandstone under the conditions of alternative submersion and emergence. We all know that at Karnak and Luxor the sandstone near the ground has suffered terribly. These buildings stand during parts of the year in water. The buildings of Philæ it may be said will suffer in the same way as they will also stand in water for part of the year. If so we shall find the quay walls surrounding the island to be very much decayed. But as a matter of fact the stones are in splendid condition. Their annual Nile bath does them no harm at all.

Then at Luxor we have a sort of jetty or pier running out into the river. This is for part of the year completely under water and comes out again without damage. The Nile water flowing round these buildings does them no harm. But when it gains access to the stone by infiltration, rising up from below and not merely flowing round, then the salts which it has taken up in passing through the earth eat into the stone and cause the damage.

This has been fully realised and already at Luxor a channel is made to let the rising Nile enter the temple area and another to let it pass away, so that infiltration is prevented as far as possible. At Karnak it is hoped to gain the same result by channels now in course of formation.

Having shown that the Nile water does not of itself carry pernicious ingredients with it, we have still to consider what effect a thorough soaking of the subsoil and an immersion of the foundations quite beyond anything they have before undergone may have upon Philæ.

If a building has been constructed on a wet soil, draining is almost certain to cause settlements and dislocations. If, on the other hand, it has been built on the dry, the admission of underground water also has a similar ill effect.

The heavy buildings at Philæ stand I believe in every part on rock, but behind the quay walls are great masses of filling in, partly with stone chips and partly with Nile earth.

With the admission of water there will be imminent danger of some movement in the filling in. The earth or brickwork will swell, and unless precautions are taken will possibly push forward some of the quay walls.

It is one of the peculiar features of Egyptian construction that solid and massive as the walls appear to be they are not well bonded together with long stones running through from face to face of the wall. The walls, two stones in thickness, are rather like a sandwich on edge, and one half can and often does fall away from the other. Walls so built have, in the conservative climate of Egypt stood for thousands of years, but shake them a little or alter their conditions and danger if not collapse will follow.

This brings us to the third consideration, viz. :

What steps it is proposed to take to counteract the possible danger?

We may dismiss from our minds the laughable idea of raising the island, or of dislodging the temples from their resting places and reconstructing them on the top of a rock somewhere near at hand.

The Egyptian Government has not been advised to launch upon any such silly and costly experiments.

Two courses are open, one is to keep out the water by enclosing the island with a surrounding water-tight wall; the other is to let the water flow in after the foundations and walls have been minutely examined and thoroughly fortified.

To speak of the first course proposed, namely, to enclose with a wall. At the best, the result would be very uncertain and the work exceedingly costly whilst the effect upon the landscape would be ruinous.

The uncertainty lies in the fact that the granite rock is

not without fissures, the boulders are, of course, separated one from the other by considerable fissures. Every one of these must be absolutely closed or the water would enter by infiltration from below and the last state of those temples would be worse than the first. Then, really to inclose the whole island with its quay walls, the great inclosure must be built in the bed of the Nile.

A sad and sorry object the island would appear, only the upper part visible above the top of the huge inclosing wall, and at what a cost must such a wall be maintained. The lover of beauty would justly curse the archæologists who had proposed such an ugly thing; and the Government, which had saddled its successors with its maintenance, would not be held in blessed remembrance.

Of the second course proposed, unfortunate as it is that any such works have to be undertaken, we may at least say that there will be very little change in the appearance of the island from without and not so very much shall we see when we are on it: for we must accept the fact that, if the surface were not disturbed by reason of the reservoir it would shortly have undergone one of those very drastic "deblayments" to which so many of the venerable ruins of Egypt have been and are being subjected.

With great liberality and foresight the Egyptian Government has determined that all the substructures shall be carefully examined, and that by concrete, stonework or other means as the necessity may arise, every part of the substructures shall be fortified.

The quay walls are for the most part built as a facing to the granite boulders behind them, and it will not be a difficult matter to get between the two, filling in all the joints and crevices; a work which will make these walls more strong than they even were before, whilst from the outside no change would be seen. The Coptic church, which is very ill built, will probably present the greatest difficulties, and also the little building of Nectanebo.

Everything upon the island is to be carefully surveyed and noted, so that a record will be kept of all and everything, both that which remains and that which has to be removed.

In result, the island and its contents will have been thoroughly examined, surveyed and fortified even sup-

posing that the construction of the reservoir be indefinitely postponed.

I cannot affirm that the wall forming the dam will not be visible from the island of Philæ. I think it will not, under the modified scheme, be visible, except from the pylon tops.

The modification now decided upon by the Egyptian Government does not only respect Philæ to a considerable extent, but as has before been said it relieves the Valley of the Nile, south of the island, from the terrible devastation which it was to experience at the hands of the irrigation engineers.

As we now see it, the Valley of the Nile, south of the first cataract does not show an area of cultivation of any extent. A thin line of cultivated ground lies on either side of the river except where in some cases the rocky hills come up close to the water and in others the invading sand of the desert covers the alluvial soil which lies under it. The encroachment of the sand is chiefly on the western side of the river. On the western side, curiously enough, are nearly all the ancient remains of importance, and there is enough to show that not only temples but towns once lay on this side and that consequently at one time there was a considerable amount of cultivation. One reason for the impoverished condition in which we now see the country has been the brutality of its conquerors. Burkhardt, who travelled up the Nile Valley in 1813 just after the Mamelouks had retired up the valley before the Turkish troops of Mohammed Aly, gives a description of the devastation caused by the war. The miserable natives were pillaged equally by both parties. After the retreat of the Mamelouks, a terrible famine broke out in which one third of the population of Nubia perished through absolute want.<sup>1</sup> The remainder retired into Egypt where numbers were carried off by smallpox. Some of the remainder had begun to return just before his visit.

The absolutely deserted towns, the numbers of graves, are still a witness to the miseries of these times.

What has been cultivated can no doubt be cultivated

<sup>1</sup> *Travels in Nubia*, J. L. Burkhardt. London. John Murray. 1819, p. 11-12.

again, and we may be glad that the scheme which to favour Egypt would have devastated a considerable part of Nubia, has, by the foresight of the Government been so well modified.

To assist in designing the large reservoir the whole of the Nubian Valley up to Wady Halfa had been levelled and surveyed, although the latter had not been done with very great minuteness. It is understood that now the materials collected will all be available as a skeleton for a comprehensive and careful survey of the valley, indeed, I understand that preliminary work has already begun. It cannot be doubted that the result will be of immense scientific value more particularly should the investigation be confined not merely to archæology, but extended to other sciences which are in no way less interesting and valuable.

For my part I think we cannot well over-estimate the very liberal views taken by the Ministry of Public Works, and without going out of my province and offering any criticism on the value of the greater or the lesser reservoir, we can all acknowledge the value of the comprehensive survey to which the subject has given birth.

I may conclude with saying a few words about the effect of the water in depositing its sediment upon the island of Philæ.

In the middle of the summer at the time of high Nile the waters rise to within a few feet of the floor of the island. At this time they are very fully charged with deposit. It is at this time that they now enter the Temple of Luxor, and in one season a deposit of not less than 10 centimetres = 4 inches is laid down.

As the waters retire this shows as an ugly sea of mud which presently contracts as it dries seamed with gaping fissures. Nothing can be more unsightly. At this time the doors in the Assouan dam will all stand open and the Nile will flow on at its normal level. Not until the Nile flood begins to subside will the doors of the dam begin to be closed and when they are all closed and the reservoir is being filled, the deposit in the water is very much reduced in quantity, so much so that we may assume not more than a fourth part of the suspended

matter is left to be deposited. It is a miserable prospect to think of any deposit at all, but it is at least a satisfaction to know that the sea of mud we find at Luxor will not be visible at Philæ. So far as I have been able to observe I do not find that the deposit is laid by the retiring water except on the floors. I suppose that whatever sticks to the walls at Luxor quickly dries and either falls off or blows away, in any case the faces of the walls in that temple are not covered with mud or slime, but only the floors, and if there is not a deposit on the walls at Luxor still less will there be at Philæ.

At Luxor the waters fully charged, are more or less stagnant, the inlet and outlet being but small and yet the wall faces are free of deposit. At Philæ the mud does not stick to the quay walls, and we may therefore feel sure that the water less charged which touches the temple walls will not leave a deposit.