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EGYPT

REPORT ON DETERIORATING ASNA BARRAGE

Cairo AKHBAR AL-YAMN in Arabic 2 Apr 83 p 3

[Article by 'Abd al-Wahhab Mursi: "An Urgent Telegram Which Jolted the Ministry of Irrigation Said: 'The Asna Barrage Is in Danger!'"]

[Text] Cracks and gaps have been spreading like cancer in the structure of the barrage for the last quarter of a century!

The prescription for a temporary cure would cost 2.5 million Egyptian pounds, and would involve 1,200 injections of cement, with each injection of cement being 15 meters long.

A permanent cure would cost 150 million Egyptian pounds, and would involve the building of a brand-new barrage equipped with an electric power station.

It all started with a telegram, consisting of just a few words, which jolted the Ministry of Irrigation. The telegram had been sent from the Upper Egypt Irrigation Inspection Office to Engineer 'Abd al-Hadi Samahah, the minister of irrigation, and it said: "The Asna barrage is in danger."

Twenty-four hours later AKHBAR AL-YAMN was on the scene, which is located 800 kilometers south of Cairo, and there it discovered a whole series of alarming surprises. It was found out that cracks and gaps have spread like cancer throughout the structure of the Asna barrage. Water from the High Dam at Aswan is leaking through the middle of the barrage with the force of a water fountain. Even frogmen with their cameras get tossed around when they are underwater in front of these streams of water which generate the pressure of fierce whirlpools. Something must be done immediately to deal with the danger of this barrage collapsing.

Experts have formulated both an emergency plan for dealing with the deteriorating situation and a long-term plan for replacing the barrage with a new barrage. The emergency plan, which is a temporary cure, involves injecting cement into the barrage in order to plug up the cracks and gaps. A total of 1,200 injections of cement, with each injection being 15 meters

long, must be done. This operation will cost 2.5 million Egyptian pounds. But the fundamental solution to the problem, according to both our experts and foreign experts, would be to speedily proceed to build a new Asna barrage which would be equipped with an electric power station. Such a new barrage would cost 150 million Egyptian pounds.

It turns out that the useful life of the Asna barrage has been over ever since 25 years ago! Water has begun to pour through the walls of the barrage with the force of water fountains. A careful inspection of the barrage has revealed the fact that cracks and gaps have spread like cancer throughout the structure of the barrage which is 800 meters long, 12 meters wide, and 18 meters high. The Ministry of Irrigation considers this barrage to be the most important one in the great series of barrages which has been erected all along the Nile, as well as along its tributaries and main irrigation canals, from Aswan in the south all the way to Alexandria and Damietta in the north. The Asna barrage is the first large barrage right after the High Dam, and it is located 160 kilometers north of Aswan. The Asna barrage receives the water which comes through the High Dam, holds up the water south of the barrage, and then lets the water run through the barrage into the Nile, on peak days, at a rate of 250 million cubic meters of water per day--enough to meet the country's demand for drinking water and the requirements of the agricultural, industrial, and social projects of Egypt's development plan.

The Asna barrage was constructed in 1908, and its useful life was to be a period of 50 years. This means then that this useful life has been over ever since 1958. Already a quarter of a century ago a new barrage was supposed to have been built in order to replace it, and this new barrage was supposed to have been equipped with an electric power station in order to help meet the country's need for power obtained from the cataracts in the Nile. This type of energy source is considered to be among the very cleanest sources of energy, especially when compared to electric power generated by nuclear plants. But then this is another story which we will not go into at this point.

The Reservoir and the Dam

One of the secrets revealed by the terse telegram concerning the danger of the situation with regard to the Asna barrage is the fact that it was originally designed to withstand only limited amounts of pressure since it was designed to receive only the small quantity of water stored by the old Aswan Dam--before it was heightened twice. But then the High Dam was built and the amount of water held back by the High Dam turned out to be far more than what was stored by the old Aswan reservoir. Consequently there was an increase in the amount of water which came through the High Dam to be stored by each of the barrages erected along the Nile. This situation especially affected the Asna barrage, which was then subjected to pressures and loads which it was not originally designed to withstand.

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It is not that the useful life of the Asna barrage has been over ever 50 years ago! Water has begun to pour through the walls of the barrage with the force of water fountains. A careful inspection of the structure revealed the fact that cracks and gaps have spread like cancer along the structure of the barrage which is 800 meters long, 12 meters high and 8 meters high. The Ministry of Irrigation considers this barrage the most important one in the great series of barrages which has been erected along the Nile, as well as along its tributaries and main canals, from Aswan in the south all the way to Alexandria and Cairo in the north. The Asna barrage is the first large barrage right up to the High Dam, and it is located 160 kilometers north of Aswan. The High Dam receives the water which comes through the High Dam, holds up the water south of the barrage, and then lets the water run through the High Dam to the Nile, on peak days, at a rate of 250 million cubic meters per day--enough to meet the country's demand for drinking water and the requirements of the agricultural, industrial, and social projects development plan.

The Asna barrage was constructed in 1908, and its useful life was to be 50 years. This means then that this useful life has been over 42 years. Already a quarter of a century ago a new barrage was planned to have been built in order to replace it, and this new barrage was planned to have been equipped with an electric power station in order to meet the country's need for power obtained from the cataracts in the Nile. This type of energy source is considered to be among the very best sources of energy, especially when compared to electric power generated by nuclear plants. But then this is another story which we will discuss at this point.

The Asna Barrage and the Dam

The secrets revealed by the terse telegram concerning the danger of the High Dam with regard to the Asna barrage is the fact that it was designed to withstand only limited amounts of pressure since it was not intended to receive only the small quantity of water stored by the old Aswan Dam before it was heightened twice. But then the High Dam was built up to the amount of water held back by the High Dam turned out to be far more than was stored by the old Aswan reservoir. Consequently there was a great increase in the amount of water which came through the High Dam to be held back by each of the barrages erected along the Nile. This situation has affected the Asna barrage, which was then subjected to pressures which it was not originally designed to withstand.

According to Engineer Ramzi Nassar, the resident engineer and overseer of the project to inject cement into and reinforce the Asna barrage, another result was that the water began eating away at the front wall of the Asna barrage. This created holes in the wall, and water penetrated through these holes until it reached the mortar of the barrage, and this mortar was then eaten away as a result of interaction with the water. Cracks and gaps then appeared inside the structure of the barrage, and the water, with all of its force and pressure, began pouring through the cracks and gaps until it reached the back wall of the barrage. The water then opened up holes in the back wall and began pouring through with the force of water fountains. This phenomenon can be seen most clearly in the canal lock wall erected at the western end of the barrage, in the 120 foundations of the barrage itself, and inside the 119 sluices which are located between these foundations!!

The Bedding and the Piers

All of the large barrages erected along the Nile have enormous concrete bases which rest on the bottom of the river bed and extend from one bank of the river to the other. These bases are called the "bedding" and are the foundations upon which all of the barrages rest. On top of this bedding we have the foundations which the engineers call the "piers." Above that we have the surface of the barrages which extends above the piers and over which all of the traffic--cars, pedestrians, and animals--moves.

The Frogmen

In order to deal with the situation, it is not sufficient merely to know all of the above-mentioned information. One must utilize the most advanced methods available to diagnose a case such as this. In foreign countries they have already produced sonar apparatuses which are capable of rendering a live image of every square inch of the inside portion of the structure of a barrage. There are also special television cameras which can be utilized to make underwater color sound films. These sonar apparatuses have not been available to us, and we therefore resorted to utilizing another diagnostic approach.

A team of frogmen utilized by the irrigation maintenance workshops did some diving. Each one of the frogmen carried a television camera and had a microphone inside the steel helmet which he wore and which was attached to his diving suit. This team included engineers and technicians who had been trained in this type of operation. Every day each frogman would dive underwater two or three times, spending 2 hours underwater each time. Another team of technicians was on shore and recording all of the information which the frogmen underwater received via their microphones and cameras. The frogmen spent a total of 340 hours underwater, and the cost of this operation was 53,000 Egyptian pounds.

No discussion on the question of giving a mandate because the Palestinian leadership action is to constantly study the needs of the projected issues. The decision is then taken and this study guides our political movement.

[Answer] When we chart the lines of our political action, we, as the PLO, must rely on a number of mainstays. The first is to provide a united Palestinian position on which the Palestinian political movement can constantly rely.

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Bedding and the Piers

Some of the large barrages erected along the Nile have enormous concrete bases which rest on the bottom of the river bed and extend from one bank to the other. These bases are called the "bedding" and are the foundations upon which all of the barrages rest. On top of this bedding we have the foundations which the engineers call the "piers." Above the piers we have the surface of the barrages which extends above the piers over which all of the traffic--cars, pedestrians, and animals--moves.

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In order to deal with the situation, it is not sufficient merely to know the information of the above-mentioned information. One must utilize the most advanced methods available to diagnose a case such as this. In foreign countries they have already produced sonar apparatuses which are capable of rendering a live image of every square inch of the inside portion of the structure of the barrage. There are also special television cameras which can be utilized to take underwater color sound films. These sonar apparatuses have not been available to us, and we therefore resorted to utilizing another diagnostic approach.

A team of frogmen utilized by the irrigation maintenance workshops did some work. Each one of the frogmen carried a television camera and had a microphone inside the steel helmet which he wore and which was attached to a diving suit. This team included engineers and technicians who had been trained in this type of operation. Every day each frogman would dive underwater two or three times, spending 2 hours underwater each time. The other team of technicians was on shore and recording all of the information which the frogmen underwater received via their microphones and cameras. The frogmen spent a total of 340 hours underwater, and the cost of this operation was 53,000 Egyptian pounds.

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The most dangerous evidence produced by the color television films was the fact that the cracks and gaps had spread not only throughout the piers which support the surface of the barrage. The cracks had also reached the concrete bedding resting on the river bed, that is, they had reached the foundations which support the 120 piers which, in turn, support the entire weight of the surface area of the barrage!

Films shot at a depth of 18 meters underwater also showed that some of the sluice gates which control the flow of water had fallen to a lower depth. The result of this was that there were strong whirlpools and water currents which endangered the lives of the frogmen as they did their job. The whirlpools pushed the frogmen's cameras around and nearly tore them out of their hands. In fact, these whirlpools and currents were tossing the frogmen themselves around. They found themselves drifting around underwater just like astronauts in space where there is no gravity.

They Knew About It

All of these shortcomings in the Asna barrage and the other barrages erected along the Nile were not a surprise. All of this has been known perfectly well for years, due to extensive research and studies that were conducted and published under the title of "The Side Effects of the High Dam, and How to Deal With Them." This work was published before any construction began on the High Dam. Why have we been silent about this for so long, and why did we not begin to deal with this situation at the appropriate time?

After the Honeymoon

During the sixties Egypt entrusted the Soviet Union with the job of building the High Dam. The Soviets then actually did build the dam during the honeymoon period which prevailed in relations between Egypt and the Soviet Union. There was an agreement made by both parties to immediately begin to take the necessary preventive measures in order to avoid all of these consequences after finishing the building of the dam itself.

But what happened was that, after the High Dam was built, 'Abd-al Nasir was not around anymore, Khrushchev was not around anymore, and when they disappeared the honeymoon which had characterized relations between the two nations also disappeared. Not a single step to avoid the High Dam's side effects was implemented.

The Minister in the U.S.

While the minister of irrigation was visiting the U.S., he utilized this occasion to ask USAID to furnish some aid for the purpose of making a study of the barrage and discovering the best means of reinforcing it. USAID then requested some additional data concerning the barrage and then negotiations with the representatives of USAID began in Cairo. The result was that a definite agreement was reached which stipulated that U.S. experts would inspect the barrage and furnish the necessary aid to repair and reinforce it. These experts in fact did come to Egypt, they accomplished their task, and then they returned to their own country.

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[Answer] When we chart the lines of our political action, we, as the PLO, must rely on a number of mainstays. The first is to provide a united Palestinian position on which the Palestinian political movement can constantly rely.

obstacle that might arise on this path. The days following the Beirut battle abounded with situations in which there was disagreement of opinions between us and the Syrian brothers, whether toward issues of the war in Lebanon, toward the nature of the Palestinian political movement with some Arab countries or the nature of this activity in the European theater. These

The Diagnosis and the Cure

By now the whole diagnosis process has been completed, and the only thing left to be done is to implement the cure.

Experts from the Ministry of Irrigation say that there is a type of quick cure which is temporary and which can be used to save what can be saved. It would take at least a full year to implement this quick cure, it would cost 2.65 million Egyptian pounds, and it would consist of injecting cement into the cracks and gaps of the barrage in order to fill them up. Another basic and definite cure would require a minimum of 7 years' time and would consist of building a new Asna barrage which would be supplied with an electric power station--after which time the present barrage would no longer be used. The cost of building the new barrage would be 150 million Egyptian pounds, at 1982 prices. It is interesting to note that the present barrage cost only 870,000 Egyptian pounds when it was constructed in 1908. In other words, the difference in prices is such that prices are 170 times as high as they were 75 years ago. And that is not all.

We Administer the Cure

The ministry then put the Asna barrage injection process up for international bidding, and Egyptian firms participated in this bidding. The contract was awarded to an Egyptian company which specializes in this type of work. This company is one which was formed with personnel who have had experience working on the High Dam and know how to use the required equipment.

Native Egyptians

Right now work is going on at the Asna barrage to implement the quick temporary cure. The engineers and workers are using enormous drilling apparatuses to drill 1,200 holes which are a total of 18,000 meters long, and each hole is 15 meters long. This will cover the entire structure of the barrage. The operation will require 1,500 tons of cement. So far 688 holes have already been injected with cement, and mortar-mixing machines that operate by means of air pressure have been utilized.

Engineer (illegible) Mahmud, the company's representative who is in charge of the operation on site, said: "The drilling process is being done by a drilling machine, the arms of which have a ring-shaped diamond cutting edge like a glass-cutting tool. These arms rotate at very high speed as the drill rotates. The drill penetrates the structure of the barrage to a depth of 15 meters, and then is taken out along the core. The price of a single cutting-edge unit for each drill is 1,000 Egyptian pounds. Several cutting edges of this type have been lost when the drills penetrated to large cracks in the structure of the piers and the cutting edges then fell off of the drills, passed through the open cracks, and then fell to the bottom of the river."

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Ahmad al-Sayyid, a geological engineer, is in charge of the drilling operations. He said that work is proceeding on schedule in spite of the heavy traffic along the top of the barrage which goes on during most hours of the day.

Husayni Muhammad Husayn is also a geological engineer and is the company's engineer for injection processes. He said that the process of injection is being carried out by means of utilizing special mortar mixers which operate by means of air pressure and which are so efficient that they guarantee that all of the cracks and gaps which are being injected with cement will be totally filled up with cement.

Among the numerous points brought to the surface by the brief telegram that was received by the minister of irrigation there is one final extremely important point which we should mention. It is as follows:

The experts at the Ministry of Irrigation saw themselves confronted with a momentous decision which had to be made. They decided to restrict this quick and temporary cure to the piers and not to extend the cure to the bedding which the barrage rests upon, even though the cracks and gaps had also spread to the bedding. Injecting the bedding with cement would require drilling of hundreds of linear holes in this bedding which is 18 meters underwater. Experts were afraid that, if they did this drilling, the water would rush into these holes and this would make it impossible to inject cement into them. The result then would be that we would have created hundreds of new holes, with each hole being 3 meters long, in the structure of the bedding in addition to the cracks which the bedding already has. This would certainly make it possible for the entire barrage structure to collapse!! This was the opinion of Engineer William Kamil, undersecretary at the ministry and head of the department which deals with large barrages and reservoirs.

This is why it was decided to restrict the cure to the piers and to inject them from the top which is above the level of the water. It was decided to leave the bedding, which rests on the Nile River bed, as is because by at least 7 years from now a new barrage is going to be built anyway. This new barrage will replace the current one whose useful life ended 25 years ago!

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primarily this enemy has always relied on two points in scoring his victories: first, dividing the Arab ranks and second, dealing with this or that front separately.

This is what has happened in all the Arab-Israeli confrontations. After isolating the Egyptian force from the Arab nation--a force which this nation

has not succeeded. The Israeli enemy has tried throughout the past phases to divide the people at home and abroad but the answer has always come from the heart of the occupied homeland in ceaseless demonstrations and strikes and in statements issued by all the national organizations--demonstrations, strikes and statements that the entire world has followed. This answer is