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NATURAL RESERVOIR ON BLUE NILE FIFTEEN MILES OUT FROM LAKE TSANA

The Sudan, where the English hero Gordon waited in vain the relief that Mr. Gladstone never sent—an error, by the way, that caused Mr. Gladstone to change from prime minister of the British Empire to a retired country gentleman in the neighborhood of Folkestone, Suffolk—is about to undergo a transformation from barren, shifting sands, more treacherous and less hospitable than the waves of the North Sea, to a veritable garden. A succession of harvests and pleasant reaches of cultivated fields will greet the traveller along that railway which Kitchener pushed from the junction of the Blue and the White Niles, straight across the sands to Khartoum, and there avenged the death of Gordon. In the Sudan, when it rains, the stolid Mohammedans fall on their knees and pray. Such events are told and retold from one generation to another. In other words, scientists calculate that it rains in the Sudan proper about once in every 100 years.

The transformation of the Sudan from an arid, sand-blasted desert to one of the most fertile countries of the world, it is expected, will require five years of hard labor, about \$50,000,000, and a force of some 300 European engineers and overseers, and probably from 20,000 to 40,000 fellahs.

The tremendous change in the prosperity of Egypt is owing to the marvelous engineering which has enabled the British to dam the Nile in several places and by the construction of regulators to make it possible for the Valley of the Nile to secure a regular and certain irrigation. This means that the famines which enabled Joseph to gain the favor of the Pharaoh

by his true Jewish forethought and commercial ability are now a thing of the past in Egypt. The lean and fat kine have been replaced in modern Egypt, under the sagacious ruling of Lord Cromer, who, in the name of the Khedive, rules Egypt and keeps in his embroidered pocket the great key to the Suez approach to India by a constant succession of well-fattened beves. More than that, without vexatious taxation, the Egyptian fellah has been able to pay more than the interest of the bonds and stocks issued to secure the funds of the irrigation in Egypt proper.

But the Sudan, which is separated from Egypt by the lofty cliffs of the Nile Mountains, and which is really a strong depression which leads up to the slightly higher desert of the Sahara, presents a problem in irrigation far more difficult. Nevertheless, the engineers, who for years have been studying the possibilities of the Blue Nile in connection with irrigating the Sudan, have solved the question.

The water, which it is proposed to store and gradually let drivel down during the dry season in the bed of the Blue Nile, actually descends from the heavens over a large section of Abyssinia. As a result the British fertilization of the Sudan practically and politically depends upon the consent of Emperor Menelik, the most potent barbaric and altogether crafty ruler of Abyssinia. Menelik withheld his consent for some time. In the first place, the Sudan was the natural and providential guarantee against his future absorption into the maw of the British lion. With a cultivated and consequently populous and

more or less civilized Sudan, Abyssinia would occupy the now historical and traditional post in British diplomacy of being the next natural and inevitable addition to the British Empire. However, Menelik has been worked on so thoroughly and so skilfully that his consent has been given, despite the counter-intriguing of the French Foreign Office. The key to the whole situation is Lake Tsana. Lake Tsana is about the size of Lake Ontario and is the largest body of fresh water in North Africa. While not the chief source of the Blue Nile, which gushes through the Sudan five months in the year, and is merely a succession of shallow puddles the remaining time, it is the only possible hope of Sudan irrigation. And yet, now that it has been arranged with Abyssinia, the problem of irrigating the Sudan is in many ways an easy one. The Blue Nile has none of the terrific falls which plagued the engineers who arranged for the control of the real Nile.

As regards the work necessary to convert Lake Tsana into a reservoir to store 30,000,000,000 gallons a regulator should be built on the outflow channel about 15 miles distant from the lake. The regulator would have 40 openings of nine feet each, with its floor sunk 12 feet below the high water level in the lake; it would be capable of passing 300,000,000 gallons a day and

would have to hold up six feet head of water. The rock bed above and below the regulator would have to be cut down for some distance to form the channels of approach and discharge. Were such a reservoir made, a dam near Wad Medani would also be necessary to provide for the distribution of the summer water to the lands lying in the Ghezirah, south of Khartoum, between the White and Blue Niles, and the lands on the right of the Blue Nile.

Lord Cromer, in a recent interview, figures out that the dams and locks of the entire Sudan system will cost \$7,000,000, while the canals and basins will cost \$30,000,000. The necessary bond issues for commencement of the work, amounting to \$10,000,000, were all absorbed in London and New York about 18 months ago at a very fair figure. The interest is at a little over 4 per cent, while Lord Cromer declares that, managed in the same fashion as the irrigation of Egypt proper, at the end of 10 years the revenues derived from Sudan irrigation should pay a little over 10 per cent on the investment, thus leaving a clear 6 per cent to be poured into the sinking funds under Lord Cromer's control. The working out of these irrigation problems in Egypt have been the financial and human salvation of the country.



LORD CROMER, BRITISH PREMIER IN EGYPT.



Planting an Engineering Line on Natural Dam Near Khartoum

Department at Washington. In British hands the spade and ploughshare inevitably succeed the sabre and the rifle. The picture of the undaunted and abandoned Gordon holding his mud-walled citadel in Khartoum in 1880, dying finally upon the savage spears of the Mullahs' Arab horsemen, is slowly but surely fading to give place to a Sudanese landscape of rose gardens and fields ripe for the harvest. Certainly the fairy tales of the future will be those created by that modern magician—the engineer; those engineers who now boldly attack a continent and change the face of nature as moulded thousands of years ago.

What Sulphur Does

For the Human Body in Health and Disease.

The mention of sulphur will recall to many of us the early days when our mothers and grandmothers gave us our daily dose of sulphur and molasses every spring and fall.

It was the universal spring and fall "blood purifier," tonic and cure-all, and mind you, this old-fashioned remedy was not without merit.

The idea was good, but the remedy was crude and unpalatable, and a large quantity had to be taken to get any effect. Nowadays we get a lot of the beneficial effects of sulphur in a palatable, concentrated form, so that a single grain is far more effective than a tablespoonful of the crude sulphur.

In recent years, research and experiment have proven that the best sulphur for medicinal use is that obtained from Calcium Sulphide and so in drug stores under the name of Stuart's Calcium Wafer. They are small chocolate coated pellets and contain the active medicinal principle on sulphur in a highly concentrated, effective form.

Few people are aware of the value of this form of sulphur in restoring and maintaining bodily vigor and health; sulphur acts directly on the liver and excretory organs and purifies and enriches the blood by the prompt elimination of waste material.

Our grandmothers knew this when they dosed us with sulphur and molasses every spring and fall, but the crudity and impurity of ordinary flowers of sulphur were often worse than the disease, and cannot compare with the modern concentrated preparations of sulphur, of which Stuart's Calcium Wafer is undoubtedly the best and most widely used.

They are the natural antidote for liver and kidney troubles and cure constipation and purify the blood in a way that often surprises patients and physicians alike.

Dr. R. M. Wilkins while experimenting with sulphur remedies soon found that the sulphur from Calcium was superior to any other form. For it was kidney and blood troubles, especially when resulting from constipation or malaria, I have been surprised at the results obtained from Stuart's Calcium Wafer. In patients suffering from boils and pimples and even deep-seated carbuncles, I have repeatedly seen them dry up and disappear in four or five days, leaving the skin clear and smooth. Although Stuart's Calcium Wafer is a proprietary article, and sold by druggists, and for that reason to nothing so safe and reliable for constipation, liver and kidney troubles and especially in all forms of skin disease as this remedy.

At any rate people who are tired of pills, cathartics and so-called blood purifiers, will find in Stuart's Calcium Wafer a far safer, more palatable and effective preparation.



RESERVOIR HOUSE USED BY ENGINEERS