

devised for harvesting and marketing on a sufficiently large scale, but at present the obstacles seem insuperable

The encroachment of the papyrus mat upon the open water of the river channel has often been such as to close up the river channel altogether, but since the advent of dredging machines and the more frequent passage of steamers, the trouble has not occurred.

The river discharge at the lower end of the swamp is fairly constant throughout the year, the flood variations being slight. This is due to the fact that, the origin of the river being in the Great Lakes, the lakes themselves serve as reservoirs to equalize the seasonal variations, and also the great swamp region serves as a further regulator of the variable quantity issuing from the Great Lakes.

*Tributaries of the Nile.*—After leaving the swamp region the only tributaries entering the Nile are the three rivers from the east, the Sobat, the Blue Nile, and the Atbara. These three rivers differ greatly in their characteristics, and it is necessary to consider them carefully to gain a correct idea of the very peculiar behaviour of the waters of the Nile. After receiving the Atbara, a short distance above Berber, the Nile receives no further tributaries but pursues its way alone through a practically rainless country for a distance of 1,600 miles to the sea, ever giving up its waters to supply the needs of the eleven million people who live along its banks. So great is the demand upon the river that for fully three months in the year no water at all reaches the sea, the sluice gates of the last great dam below Cairo being tightly closed, and even caulked, to prevent leakage.

*Losses by Evaporation.*—Under the tropical sun, and passing for the greater part of its length through a rainless country, the Nile is continuously losing its water. It has been estimated that the evaporation from the surface of the river alone is as much as 3" per day, and in addition there is the loss by absorption into the banks. A great reduction is also caused by the spilling over into the great swamp region of the Bahr el Gebel. This area may be likened to a huge evaporating pan of about 20,000 sq. miles in area, and the river can be observed visibly flowing over its edges into the swamp. So many and complicated are the causes operating in this region to reduce the water that a long series of careful observations will be necessary before definite conclusions can be drawn, and these observations are now being made. Sir William Garstin estimates that from 50 to 60% of the volume of the White Nile is lost in passing through this swamp. It is here, therefore, that plans are being made so to regulate and control the river that this loss may be reduced.

*Sources of the Alluvial Deposit.*—All the water which reaches lower Egypt is derived either from the White Nile or its two tributaries, the Blue Nile and the Atbara. The waters of the White