Hydrobiology of Lake Volta, Ghana

II. Some Observations on Biological Features Associated with the Morphology and Water Stratification

by

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INTRODUCTION

Lake Volta is a large man-made lake with a surface area of 7000 sq km and a length of 400 km. In May 1964 it began flooding the Volta river system and to cover an area of tropical forest and dense savanna.

The lake has a complex shape, Fig. 1, and in the first paper on its general limnology (Viner, 1970) a pattern for the regime of water circulation was suggested. It was said that the lake experienced different weather effects according to the locality and as a result different areas of the lake underwent varying degrees of mixing; those areas which were relatively sheltered from the wind having more marked thermoclines and oxygen discontinuities, indicating greater stability, than those which were more exposed. The differences were seen to depend on the morphometry of the lake. In this paper some biological effects of water mixing and morphometry are discussed.

METHODS

Dissolved oxygen was measured using a direct oxygen recording instrument (Briggs, 1964; Viner, 1970) whose thermister was used for measuring temperature. This apparatus was used not only to

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measure oxygen saturation in the free water, but also for primary productivity measurements estimated by oxygen evolution in glass jars suspended in the water. This was basically the classical technique of "dark" and "light" bottles but instead of bottles large glass jars of up to 2.5 litre capacity were used with wide mouths of four inches diameter which could thus admit the oxygen meter probe. The error involved in the instrument’s electrodes using up some of the oxygen in the confined space of the jar was insignificant during the few seconds required to take the reading. The jars were filled with surface water and suspended at depths of 1 m intervals for 4 hr during the time of maximum daily oxygen output, that is from 11.00 to 15.00 hr.