one containing ordinary tap water and the other the solution used in hydroponics; 100 cc of a culture of *Ankistrodesmus* was added to each jar. Weekly determinations were made on each aquarium, the water or solution taken out being replaced each time and the loss due to evaporation made good by the addition of the tap water. One liter was run through a Foerst centrifuge and the organic matter determined by loss on ignition; a half liter was centrifuged for plankton counts. Methyl orange alkalinity, free carbon dioxide dissolved oxygen and pH determinations were made. A 14.0 cm length of *Elodea* was placed in each aquarium and the gain in length determined weekly. At the conclusion of the experiment the plants were dried and ashed to determine the organic matter in each.

The results expressed graphically are shown in Fig. 1. The graphs show strikingly the comparatively

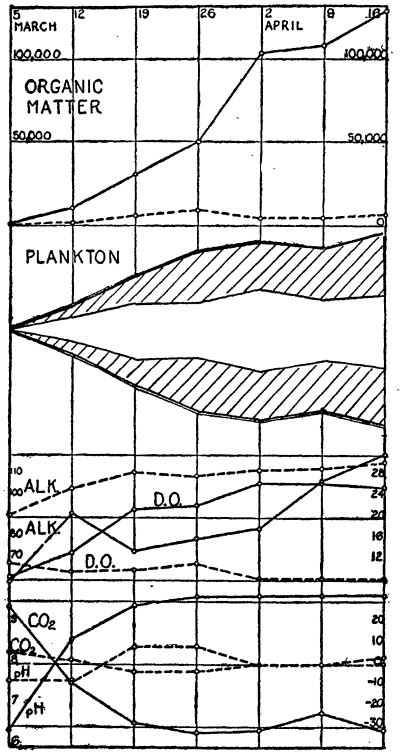

FIG. 1. Organic matter, plankton and chemical changes in aquaria containing hydroponics solution and control. Organic matter shown as milligrams per cubic meter; plankton as the number of individuals per liter, total vertical height represents fertilized aquarium, central unshaded portion the control; chemical figures in parts per million. Solid line represents fertilized aquarium, the broken line the control.

slight chemical changes in the control compared with the marked activity of the fertilized aquarium. In presenting the results of the plankton counts Lohman's spherical method was employed in order to bridge the extreme range between minimum and maximum numbers. The control ranged from 440,000 individuals per liter at the start to 440 million at its maximum, while the range in the fertilized aquarium was from 560,000 per liter to over 6 billion. *Daphnia* should be introduced after the first week or two or as soon as the culture becomes a decided green. In the present experiment the algae were allowed to multiply unchecked for six weeks, and at the end of that time, in fact long before it, the aquarium containing the culture medium was a very dark opaque green, while the control was barely tinged with a greenish color and perfectly transparent. The *Elodea* plants made their most rapid growth during the first part of the experiment due largely to the increasing green color in the culture solution and to the exhaustion of food from the control water. At the end of six weeks the plant in the culture was 32 cm in length and the control 25 cm; the condition of the two plants, however, showed great differences, the control being a sickly pale color with very short leaves on its terminal portion and no roots, while the other plant showed vigorous dark green leaves and numerous roots. The organic matter of the control amounted to 156.06 milligrams and that of the other plant 242.51 milligrams. It should be pointed out here that no soil was placed in either jar and this fact contributed to the very poor growth of the control plant.

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BOOKS RECEIVED

ALDRICH, JOHN W. and BENJAMIN P. BOLE, JR. *The Birds and Mammals of the Western Slope of the Azuero Peninsula.* Pp. 196. Cleveland Museum of Natural History.

BENJAMIN, A. CORNELIUS. *An Introduction to the Philosophy of Science.* Pp. xvi + 469. Macmillan. $3.50.

DANTZIG, TOBIAS. *Aspects of Science.* Pp. xi + 285. Macmillan. $3.00.

DITMARS, RAYMOND L. *The Making of a Scientist.* Pp. xii + 258. 41 photographs. Macmillan. $2.75.

FINDLAY, ALEXANDER. *A Hundred Years of Chemistry.* Pp. 352. Macmillan. $4.25.

HEWITT, J. N. B., Editor. *Journal of Rudolph Friederich Kurz.* Translated by MYRTIS JARRELL. Pp. ix + 382. Bureau of American Ethnology, Bulletin 115. Smithsonian Institution. $0.60.

KLINEFELTER, LEE M. *Electrical Occupations for Boys.* Pp. 227. Illustrated. Dutton. $2.00.

LIPS, JULIUS. *The Savage Hits Back.* Pp. xxxi + 254. 213 figures. Yale University Press. $5.00.

STAGNER, ROSS. *Psychology of Personality.* Pp. xi + 465. 24 figures. McGraw-Hill. $3.50.

VAN DEN BERGH, GEORGE. *Astronomy for the Millions.* Pp. xii + 370. 18 plates. 34 figures. Dutton. $3.50.

VIOSCA, PERCY, JR. *Pondfish Culture.* Pp. xxiii + 260. 68 figures. Pelican Publishing Co., New Orleans. $4.00.