position as far from the axis as possible. In each case the action is due to the difference in direction of the "apparent vertical" for the center of mass of the floating body, and that for the center of mass of the displaced fluid.

The phenomenon is easily observed by placing a crystallizing dish on the turntable of a victrola, fastening it centrally, half filling it with water, and after steady rotation has been established using the ping-pong ball and the weighted wooden ball as described above.

The experience recalls Edgar Allan Poe's tale "A Descent into the Maelstrom," where the old fisherman saved himself by abandoning the faster moving ship (center of mass above the water surface) for the cask that barely floated him. If Poe's tale were not merely a wild dream, one would look for the explanation of the motions of the floating objects, not in the reference he gives to the second book of a hypothetical work by Archimedes on *Hydrodynamics* (!)[1] but in the principles herein described. The vortex imagined by Poe would be probably more like a free vortex with the curvature convex to the axis, in which case it would have been better perhaps if the fisherman had stuck by his ship.

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SELENIUM AS AN INSECTICIDE

A RENEWED interest in the use of selenium compounds as insecticides prompts this communication, which may serve as a warning against such use without adequate investigation as to the possible dangers involved. In the search for better insecticides attention has been directed from time to time to the fact that selenium compounds possess many desirable qualities for this purpose. A number of patents have been granted in this country and abroad covering the use of selenium compounds for making insecticides. Although the use of such compounds may be very limited, it is believed that the danger of even minute quantities of selenium in soils on which food products are grown has not been fully appreciated.

Studies carried out during the past year in the Bureau of Chemistry and Soils and the Bureau of Plant Industry of the Department of Agriculture show that selenium in the soil is assimilated by plants and that a particularly toxic compound is elaborated. Fifteen parts per million of selenium in the soil, added as sodium selenate, and under some conditions even lower concentrations, produce distinct chlorosis and stunting of wheat plants. Quantities as small as one part per million permit growth and maturation with no visible symptoms of injury to the plant. However, when the grain or straw from such plants is fed to experimental animals, such as rats and guinea-pigs, it produces a pronounced toxicosis characterized by retardation in growth, and death occurs in a few weeks. Wheat which has been found by analysis to contain 8 to 10 parts per million of selenium, absorbed from the soil, produces fatal injury with, in many cases, readily detectable macroscopic changes in the liver. Selenium is present in the grain in intimate association with the protein, but in what form has not yet been determined.

In the case of common insecticides used in spraying fruit trees and vegetables, complete removal of the spray residue from edible food products, where this is possible, should eliminate the danger of the food being toxic. However, selenium can be assimilated from the soil by at least some and possibly all plants, and the degree of toxicity of the particular compound used in spraying a plant is not a measure of the toxicity of the compounds formed in the plant. Furthermore, there is evidence that selenium compounds may be reduced by soil organisms, so that spray residues ordinarily considered innocuous may be made available to the plant and be converted into highly toxic combinations.

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THE CHROMOSOMES OF XIPHOPHORUS, PLATYPOECILUS AND THEIR HYBRIDS DURING MATURATION STAGES

IT has been known for several years that two genera of poeciliid top minnows, *Xiphophorus* and *Platypoecilus*, will readily hybridize and produce some fertile offspring.

An investigation of the chromosomes during the maturation stages of two species of *Xiphophorus*, *Platypoecilus couchiana* and *Platypoecilus maculatus* and of *Platypoecilus-Xiphophorus* hybrids has just been completed, and the detailed results of the investigation will appear in print in several months. Part of the material studied was collected in the field in Mexico and part was obtained from dealers.

The haploid number of chromosomes is twenty-four in *Xiphophorus*, *Platypoecilus* and in the hybrid. The chromosome picture is so nearly identical in all three that it is difficult to find any distinctive differences. In the primary spermatocyte division the heterotypic chromosomes are seen as nineteen spherical chromosomes of about equal size and five slightly larger ones, one of which is the sex chromosome.

[1] I take Poe's spelling *incidentibus* not for a misprint for *insidentibus* but as deliberate, and as a joke that he is trying to pull on the reader.

These larger chromosomes are always found at the periphery of the spindle.

The sex chromosomes are hardly distinguishable from the autosomes in the gonial divisions. In the primary spermatocyte division one of the larger chromosomes appears at the side of the spindle. In the prophase it is very slow in taking its place on the spindle and is often prematurely divided by the time it reaches its position on the equatorial plate. The daughter chromosomes of the prematurely divided sex chromosomes then precede all the autosomes, reaching the pole of the spindle long before the autosomes. Since each resulting secondary spermatocyte receives one of the two daughter chromosomes, which are identical, the condition is interpreted as one in which the male is homogametic. It would be inferred that the female would be heterogametic and the sex chromosomes would therefore represent the ZZ″–WZ type.

An unusual condition appears in the primary gonial division in *Xiphophorus* which is interpreted as a presynaptic pairing of the diploid chromosomes. A condition comparable to this may be present in *Platypoecilus,* but has not been seen in the hybrid.

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INFLUENCE OF GREGARINES ON GROWTH IN THE MEALWORM

SOME *Tenebrio molitor* eggs were placed with sterilized food in a Petri dish. It was noted that larvae hatched away from adults did not develop as rapidly as did those hatching from eggs remaining in the culture with adults. It appears that the young may derive the gregarines either directly from the adults or from food in which the adults have remained for some time. Larvae reared with adults are larger and the mortality rate is less than those reared in sterile food in the absence of adults. Computation shows that 241 days after the beginning of the experiment the larvae reared without adults were on the average 6 mm shorter than larvae reared with adults.

It is known that the intestinal tract of Tenebrio larvae contains the protozoon, Gregarina. It was found that no larva from cultures lacking adults contained a gregarine and that no larva examined from the cultures containing adults lacked gregarines. Apparently these gregarines are essential for growth. It has not been learned whether the parasites have a function in digestive processes or not. This study is being continued.

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SOCIETIES AND MEETINGS

THE NORTH CAROLINA ACADEMY OF SCIENCE

THE thirty-second annual meeting of the North Carolina Academy of Science was held at Davidson College, Davidson, N. C., on May 5 and 6. Papers were presented before the general section of the academy on Friday morning and afternoon. On Friday evening the retiring president, J. B. Bullitt, professor of pathology in the University of North Carolina, gave the presidential address on "Early Man, Some Comparisons, Not Odious." On Saturday morning the academy met in the following sections: general section, chemistry section, mathematics section and physics section. Sixty-nine papers and six exhibits were on the program. Abstracts of most of these papers and complete papers of several will appear at an early date in the *Journal of the Elisha Mitchell Scientific Society,* Vol. 49, No. 1.

Resolutions of respect were passed in honor of Dr. Clarence A. Shore, director of the State Laboratory of Hygiene at Raleigh, and for the Reverend George W. Lay, of Chapel Hill.

The executive committee reported the election of thirty new members during the year, and the reinstatement of five former members. One hundred and thirty-three registered at the meeting.

Lane Barksdale, of the Greensboro Senior High School, for his essay, "Orchid Hunting in Guilford County," was declared the winner of the High School Science Prize, a silver loving cup, for the best essay submitted by a high-school student. Essays for 1933 were confined to the fields of biology and geography.

The officers elected for the year 1934 were:

GENERAL ACADEMY

President, B. W. Wells, State College
Vice-president, Helen Barton, Woman's College
Secretary-treasurer (for three years), H. L. Blomquist, Duke University
Representative to the American Association (for two years), C. F. Korstian, Duke University

CHEMISTRY SECTION

Chairman, H. D. Crockford, University of North Carolina
Vice-chairman, J. E. Saylor, Duke University
Secretary-treasurer, R. W. Bost, University of North Carolina
Councilor, N. Isbell, Wake Forest College

MATHEMATICS SECTION

Chairman, E. L. Mackie, University of North Carolina
Secretary, E. R. C. Miles, Duke University