existence of magnetic highs (attributed to the presence of meteoritic bodies) near the southeastern ends of certain bays. These and other aspects of the problem will be fully discussed in the forthcoming account of the bays; and further evidence will be presented which seems to support the hypothesis that the bays are essentially the product, direct or indirect, of solution; and the encircling rims accumulations of wind-drifted sand.

DOUGLAS JOHNSON

COLUMBIA UNIVERSITY

ALKALI DEFICIENCY AND FISH MORTALITY

In the January 24 issue of SCIENCE, Dr. P. B. Sears suggests that the mortality of fish at Wallingford, Conn., reported by Mr. Tomlinson (SCIENCE, November 1, 1935), was primarily due to reduction in the quantity of "soluble alkaline minerals by the time the unsettled weather conditions . . . made their appearance." This interesting suggestion is unfortunately not confirmed by the chemical data obtained at the time of the mortality. When the reservoir was visited on August 2, 1935, the day following the mortality, the alkalinity of both surface and bottom water was found to be 57.9 p.p.m. as HCO_3. This value is comparable to that obtaining in a strongly eutrophic lake near North Branford, Conn., now under intensive investigation, and considerably higher than the alkalinity of other moderately eutrophic lakes in Connecticut. Moreover, the Wallingford locality had completely recovered its oxygen on September 28, 1935, when Mr. G. A. Riley and I revisited it, without any appreciable change in alkalinity (57.3 p.p.m.). It is therefore clear that a reduction in the alkali reserve played no part in producing the mortality.

A more extended discussion of the phenomenon will appear elsewhere.

G. EVELYN HUTCHINSON

OSBORN ZOOLOGICAL LABORATORY
YALE UNIVERSITY

BACTERIOSIS OF PUMPKIN FRUITS IN CALIFORNIA

In September, 1935, an outbreak of a soft rot of young pumpkin fruits (*Cucurbita pepo*, L. var. *condensa*, Bailey) was observed near San Pablo, Calif. The disease affected immature fruits of the varieties Early White Bush Scallop, Yellow (or Golden) Summer crookneck, Zucchine and Danish, being especially destructive on all but the latter variety. Counts showed a loss of from 60 to 75 per cent. of fruits in one field, with comparable losses in other plantings. Warm moist weather appears to favor this disease, which spreads rapidly through the agency of insects, particularly *Diabrotica sp.* Isolations made from infected

fruits yielded a bacterium which upon repeated inoculations and reisolations has proved to be the causal agent. A similar organism was secured from two different localities in California and from pumpkin fruits grown at Corvallis, Oregon.

The disease affects only immature fruits. Infection of carrot roots and celery by the same organism also occurs under natural conditions.

The characteristic soft rot was produced in the following hosts: pumpkin fruits (22 horticultural varieties), carrot, celery, lettuce (leaves and stalk), cabbage (leaves and stalk), cucumber, turnip, onion, melon (four varieties), tomato fruits (green and ripe), cauliflower (leaves and stalk), stock, Opuntia (five species). The pathogen was identified as belonging to the genus Erwinia, since it possesses peritrichiate flagella. Though related in several ways it is not typical of *Erwinia carotovora* (L. R. Jones) Holland, from which it differs by having a different host range and distinct morphological and physiological characters.

Morphologically, the organism is a short rod measuring $1 \mu - 1.2 \mu \times 0.6 \mu - 0.8 \mu$. It is Gram negative and produces acid and gas in sucrose, but only acid in dextrose, glycerine, mannose, lactose, arabinose, invert sugar, salicin and amygdalin. The most striking difference from *E. carotovora* was observed on the eosin-methylene blue agar slants. On this medium *E. carotovora* produces a beautiful metallic luster comparable to that of *Escherichia coli* (Escherich) Castellani and Chalmers, while the pumpkin organism developed a light pink color in the growth without discoloring the medium. The pathogen could not be agglutinated in 2 per cent. NaCl solution at 96° C, while *E. carotovora* was agglutinated in 50 minutes. The optimum for growth is from 25° C to 31° C, while the upper thermal death point is 48.5° C.

A detailed study of the taxonomic position of the pathogen and of the susceptibility and resistance of pumpkin varieties is in progress.

P. A. ARK
C. M. TOMPKINS

UNIVERSITY OF CALIFORNIA, BERKELEY

A NEW ESTROGENIC SUBSTANCE FROM OVARIES

In the course of a series of studies carried out on the nature of unsaponifiable substance of various tissues, we have been able to isolate from ovaries a crystalline substance possessing a melting point of 95.1° C. (uncorrected), molecular weight of 320 (Rast) and of the following composition: C, 73.47 per cent.; H, 12.32 per cent.; N, 4.43 per cent.; O (by difference), 9.78 per cent.; which indicates a probable empirical formula—$C_{20}H_{41}O_2N$.

Biological assay on spayed rats indicates that .00001 milligram of the substance injected in a single dose

will produce positive estrus after 96 hours. The animals remain in heat for at least 24 hours with a gradual return to the resting stage. Even on large doses, estrus does not appear earlier than 96 hours, but persists for several days.

The crystals consequently differ both chemically and physiologically from urinary estrogenic substances, such as theelin and theelol.

This work will be reported in greater detail in another journal.

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ROBERT H. ANDREW
FREDERICK FENGER

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RESEARCH LABORATORY IN ORGANOTHERAPEUTICS
　ARMOUR AND COMPANY
　CHICAGO, ILL.

VISITING LECTURERS AND THE UNIVERSITY'S BUDGET

ONE of the advantages which European universities have over American ones is the tradition that favors itineracy among students. The ballyhoo over football and other forms of activity rooted in provincialism have so conditioned the American student's mind that university loyalties generally outweigh loyalty to intellectual standards and to personal growth. As a consequence a large proportion of graduates and almost all undergraduates, once they are matriculated in one university, will not move to another. Hence little use is made by the student of that variety of background and view-point available in a nation where over fifty thriving universities offer exactly this advantage. Thus once more, though in a new setting, arises the problem of Mohamet and the Mountain.

The relatively few American universities blessed with a very large endowment are enabled to solve this problem by means of separately created visiting lectureships. For budgetary reasons, however, this method is not open on any appreciable scale to most of our institutions.

An alternative is a plan now followed by the Department of Geology and Geography at Northwestern University. Another institution is invited to set up an exchange arrangement involving no cost to either university except the subsistence and transportation of the visitors. Honoraria are not called for and salary items remain as normally fixed in the budget. Exchanges are made for a week of lectures only, and thus the visitor's schedule at his own institution is not badly disrupted, especially if his class work during his absence is shared by his own colleagues. Whenever possible, the exchange is arranged to affect men who are students in the same field and are dealing in their advanced classes with about the same subjects, concurrently. Thus, each visitor stimulates and broadens the view-point of the other's classes. In return he receives the vivifying comments of students reared in a differing tradition. Staff members of the cooperating departments are similarly stimulated.

The plan has been in effect with conspicuous success for five academic years. Exchanges have been effected with the University of Cincinnati, the George Peabody College for Teachers, Harvard University and Washington University in St. Louis. Perhaps by increasing such a practice those American universities which can not defray the cost of expensive visiting lectureships may still be able to spread among their students a healthy appreciation of the catalysis that comes from an exchange of ideas with outsiders.

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CHAS. H. BEHRE, JR.

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NORTHWESTERN UNIVERSITY

THE DOCTOR OF PHILOSOPHY DEGREE AND MATHEMATICS RESEARCH

DEAN RICHARDSON, of Brown University, secretary of the American Mathematical Society, has prepared a careful and interesting report on the doctor's degree and mathematical research, published in the April number of the *American Mathematical Monthly,* which will be of great service to American mathematicians and others. This report and the data available in Dean Richardson's office contain such fundamental statistical information as the names of all Americans who have received the doctorate in mathematics, the names of foreign mathematicians who have joined our American mathematical group, the research papers presented to the society and subsequently published by each of these persons, and the names of all teachers of mathematics in American universities, colleges, normal schools and junior colleges during the year 1935–36.

In the report printed in the *Monthly,* details are given (1) concerning the number of degrees conferred in successive five-year periods from 1870 to 1935 by each American university, (2) concerning research productivity of the doctors of mathematics analyzed in various ways, (3) concerning the productivity of doctors who received their degrees at various leading universities, and (4) concerning the productivity of National Research Council fellows.

According to Dean Richardson's statistics, the total number of doctorates in mathematics conferred by American universities during the period 1862–1934 is 1,267, of which 168 were conferred on women. Foreign universities conferred 114 doctorates in mathematics on persons who have been active in America. The average number of pages of research published annually by persons holding the doctorate in mathematics has been slightly less than five. Over half of those holding the doctorate have published at most one research paper, and only 11 per cent. have published more than ten such papers.

The number of teachers of mathematics in American