proof the criteria set up by Professor Huntsman it must be admitted that complete evidence is lacking. He states, in effect, that it is necessary to prove "for the individual fish" not only that it has returned to its home stream, but that it has been far from the "zone of river influence" of that stream. I should like to add that it would also be necessary for completely rigid proof that the evidence be quantitatively adequate to satisfy the requirements of statistical significance. So far as I can see such rigid observational proof could only be provided by marking young fish in their "natal river," recapturing them in the sea at a point sufficiently distant to satisfy every one that the fish was beyond the "zone of river influence," tagging or marking them at that point and again releasing and, finally, to recapture them a second time in their "natal river." Needless to say, it will be some time before much such proof will be accumulated.

I think, however, that the logic of the situation is such that we need not demand such practically impossible evidence before we can say with considerable assurance that salmon do return predominantly to their native streams from whatever distance they may go in the sea. There is ample evidence, both observational and statistical, of intraspecific racial segregation in the Pacific salmon.[2] The development and maintenance of such races could not take place if there were much intermingling of the population groups on the spawning grounds. That there is some such intermingling no one would deny; but it can not be extensive in most cases and is probably confined chiefly to races inhabiting streams not widely separated. If there is not extensive intermingling of races on the spawning grounds can we say, then, that the individuals belonging to these races do not range at sea beyond the limits of "river influence"?

I do not think so. We know that very large numbers of fish do enter streams hundreds of miles from the point of tagging[3] and under conditions that warrant the assumption that the fish are well beyond the range of "river influence"—so far, at least, as has yet been determined by hydrographic studies. But there is no evidence of such wholesale admixture of races as would result if these large numbers of salmon were indeed "lost" so that they would enter any stream within the influence of which they happened to wander. If they were so lost it would seem impossible that the fish spawning in different streams could be so racially distinct as they often are even in nearby tributaries of a single river system. The simplest theory that will adequately explain all these facts is that the salmon do return predominantly to their home streams.

Perhaps one of the difficulties is due to the use of the word "instinct" with reference to "homing" and "migration." "Instinct" need not imply, although it usually does, a reaction involving factors that are not susceptible to scientific study and analysis; it need only mean that the factors have, as yet, not been determined. It can not be doubted that some kind or kinds of gradients serve to guide the salmon, as with all other migrating animals, on their journeys. These gradients may be those more obvious ones associated with "river influence" or some as yet unrecognized gradients in the ocean.

Important practical problems in the conservation of the Pacific salmon are involved because laws and regulations have been based upon the theory that the salmon do return to their home streams for spawning and the corollary that the populations in the different streams are independent and self-perpetuating. It is to be hoped that the doubt cast by Professor Huntsman upon the validity of this theory on account of the lack of complete observational proof will not affect the present general acceptance of the theory and of the obvious requirements of conservation that it demands.

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[2] Numerous publications during the years 1912 to 1933 by C. H. Gilbert, W. A. Clemens, J. O. Snyder, W. H. Rich and others in *Bull. U. S. Bur. Fish.*, *Reports Commr. Fish. for Brit. Columbia* and *Calif. Fish and Game and Fish Bulls.*

[3] C. H. Gilbert and W. H. Rich, *Bull. U. S. Bur. Fish.*, 42: 27–75, 1925; W. A. Clemens, *Prog. Repts. Pac. Biol. Sta., Biol. Bd. Can.*, 4: 11–13, 1929; A. L. Pritchard, *ibid.*, 8: 15–20, 1931.

GLASS GLOBES ON THE PACIFIC

THE glass globes mentioned in SCIENCE for February 12, 1937, p. 179, evidently float northeastward, as well as across the Pacific. We of last summer's Hrdlička expedition to the Aleutians found eight or nine of them on the northwestern shore of Kiska Island, latitude fifty-two degrees; between 177 and 178 longitude, east.

SYDNEY CONNOR

JUNIOR SCHOOL BUILDING
GIRARD COLLEGE, PHILADELPHIA

LINES OF INHERITANCE IN FAMILIES OF "BLEEDERS" AS NARRATED IN 1834

IN view of the date of publication an article from which I quote below may be of interest to students of Mendelism. It is entitled "Extraordinary Bleeders." It was published in 1834 in a "History of Ipswich, Essex and Hamilton, Mass.," by Joseph B. Felt.

There are four families in this town (Hamilton) called bleeders. Three of these are immediately and the other mediately, related. The number of individuals so denominated is five. They are thus named from an unusual propensity in their arteries. . . . Some of their predecessors have come to their end by wounds which are not

considered by any means dangerous for people in general. This hemorrhage first appeared in the Appleton family, who brought it with them from England. *None but males are bleeders, whose immediate children are not so, and whose daughters, only, have sons thus disposed.* As to the precise proportion of these, who may resemble their grandfathers, in bleeding of this kind, past observation furnishes no data.

The italics are mine.

GEORGE E. LADD

CHEVY CHASE, MD.

QUOTATIONS

THE MELLON INSTITUTE

THE formal dedication of the Mellon Institute's huge new building, a temple of science in outward appearance and inward spirit, is an event of national magnitude. And properly so when it is recalled that the institute has served some 4,000 firms, developed 650 processes and products and created ten new industries since Andrew W. Mellon and the late Richard B. Mellon founded it in 1911. The new structure is a monument not only to the generosity and far-sightedness of the two brothers who made it possible but of the late Professor Robert Kennedy Duncan, who conceived the industrial research fellowship system which has been such a brilliant success.

When the small manufacturer hears of the millions spent annually for research by great companies he wonders how long he will last—wonders how he, without even a testing laboratory, can compete with trained crews of Ph.D.'s hired to improve yarns, telephones, lamps, radio sets, tins for foods and foods themselves. The Mellon Institute is his salvation. Here for a few thousand dollars science doffs its coat, rolls up its sleeves, solves his problem, creates values for him, and what is more important, opens his eyes to the rich return that research pays.

Though this social aspect of the work done in accordance with Robert Kennedy Duncan's policy needs to be stressed, it would be wrong to regard the Mellon Institute merely as an industrial life preserver. As a non-profit-making enterprise it plows back for the public good the excess moneys that may not remain in its bank account. So we find it concerning itself with more than skinless frankfurters, soapless soaps, flaked coffee, shoes that can be polished merely by rubbing a cloth over them, razor blades, unbreakable dishes of new plastic compounds. It draws on its own scientific and financial resources to solve the problem of smoke and dust, to arrive at better ways of diagnosing tuberculosis, to study methods of treating pneumonia, to illuminate the dark subject of dental decay. Nor is it unmindful of its obligation to advance science as such. Its work in theoretical chemistry and biology, for which new facilities are provided, promises to be even more distinguished in the future. Under Drs. Robert Kennedy Duncan and Raymond Bacon, and latterly under Edward R. Weidlein, the institute has become not only the technical first-aid of big and little business, but a training school for future laboratory directors, an experiment station for the advancement of science, a clearing-house of information for the public. As such it deserves not only the good wishes and congratulations of the manufacturers whom it has served, but of a wider public that may not be fully aware of its high place in industry and science.—*The New York Times.*

SCIENTIFIC BOOKS

THEORY OF SOUND

Vibration and Sound. By PHILIP M. MORSE. New York: McGraw-Hill Book Co., 1936, pp. xv + 351, $4.00.

THE outstanding advances in acoustics during the last two decades have been made chiefly in physiology and in engineering rather than in the physics of sound. Most of the recently published books on the subject have reflected this trend, but this one by Professor Morse is written almost entirely from the point of view of the classical physicist. It emphasizes the physical principles underlying all engineering applications.

I have used the term "classical" advisedly, as from a casual reading of the announcement of the book one might get the quite erroneous impression that at least certain phases of the subject are treated by quantum mechanics. While it is true that some acoustical phenomena, such as the abnormal attenuation of sound in gases discovered by Knudsen, can not be satisfactorily explained without resort to quantum physics, these particular matters are not discussed.

A study of this book does, however, reveal that there is an interesting parallel in the relationship between electrical engineering and acoustics, on the one hand, and wave mechanics and acoustics, on the other hand. To the beginning student the general principles of electrical circuit phenomena are most easily explained by means of acoustical analogies, but in the electrical engineering art there have been developed theories and formulae covering many combinations of circuit elements with which the practicing engineer has become much more familiar than with the theories relating to