source of funds is Japanese, the choice is the U.S. rather than Europe. Thus, the predominating orientation of the Japanese zoologist seeking foreign research experience is toward this country.

Part of the explanation of the almost exclusive orientation of Japanese zoology toward the U.S. is probably historical. Before 1868 the Tokugawa government had for 250 years virtually sealed the country from contact with outside cultures, and Japanese sciences remained rudimentary while rapid advances were being made elsewhere. When the first university was formed in Japan in 1877, there was no qualified Japanese to accept the first professorship of zoology. Two Americans (E. S. Morse, of Massachusetts, and C. O. Whitman, later the first professor of zoology at Chicago) served in this capacity, successively, until 1881. In 1882 K. Mitzukuri, who had just received his Ph.D. at Johns Hopkins, became the first permanent professor of zoology at Tokyo University. Undoubtedly, the two Americans, the American-trained Mitzukuri, and their students who succeeded them laid the foundation for a strong relationship with the United States. Except in a brief period during the war years, this relationship has flourished. The ready acceptance of Japanese as scientific collaborators by American research workers, evidenced by the rapid growth of the number of such Japanese in this country, must be based on such features as good training, disciplined and energetic work habits, and general effectiveness in production of successful research.

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Oceanography at Inland Universities

William J. Hargis' letter (27 Nov. 1964, p. 1113) setting forth several objections to Spilhaus' proposal for "sea-grant" colleges seems to be taking aim not only at this imaginative idea but also at the idea that any land-bound university might dare make a serious attempt to get into the business of oceanography. When one considers that about 90 percent of the photosynthetic production of our planet occurs in the sea and that man extracts only about 1 percent of his food supply from the sea, while at the same time more than half the population of the earth is suffering from protein starvation, it is disturbing to read that a plan for a substantial increase in marine research and teaching raises fears of an "inevitable dilution of effort."

Hargis also advises against a "bandwagon leap by institutions whose locations, faculties, and facilities make them more suitable for terrestrial- or space-oriented work." There is no doubt that the marine institutes and laboratories along the Atlantic coast as well as on other coasts could effectively use additional support for their work. However, the argument that noncoastal institutions are automatically disqualified for marine research no longer holds. No university in the country is more than a few hours from a coast by air. There are other ways of carrying on marine research than by ship, for example, by remote sensing from aircraft, analysis of the great quantities of unprocessed ship data, numerical modeling, and laboratory experiments of all sorts. If ships are required, then the investigator can either arrange to "piggy-back" aboard one of the ships of the affluent oceanographic institutions or use one of the ships set aside for the community as a whole, such as Duke's *Eastward* and NSF's *Eltanin* and *Anton Bruun*. Access to the sea is no longer limited to those living on tidewater.

What facilities are peculiar to marine science? Aside from ships and circulating sea-water systems, it is difficult to point to a single facility which does not or could not exist just as well at an inland university: computers, engineering facilities, instrumented aircraft, wave tanks, dishpan models of the ocean or atmosphere, libraries all exist far from the sea.

It is always risky to generalize about university faculties, especially with regard to what they are or are not suited for. Many of our finest science faculties are located far from the sea, and in some of these there are foci of intense interest in marine science. Some of these institutions represent potential centers of excellence in the marine sciences. They have the talent, the interest, and the decided advantage of a fresh point of view. I do not believe that given substantial support they would in any way dilute the present effort. There is a continuing shortage of high-grade talent in marine science. The number of oceanographic problems and the need for their solution is rising much faster than our ability to meet them. I submit that ignoring the potential of the noncoastal institutions is shortsighted and will result in our falling farther behind in our efforts to understand the marine environment.

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Eyesight of Astronauts

I understand that one of the physical qualifications required of astronaut-scientists is perfect eyesight. This is something of a puzzle to me. No one available for the program has a skin that will withstand high vacuum, ultraviolet light, or background radiation. Indeed, considerable effort has been expended to make such a hide superfluous. Since more than 500 kilograms must be carried to correct for skin and respiratory deficiencies, what difference can the few ounces of glass or plastic needed to correct optical deficiencies make?

At one time, it was necessary for soldiers to have teeth that occluded precisely, so that they could tear open the tops of ammunition loads. Even in World War II some draftees were classified 4F because of a deficiency in this respect, before this particular anachronism was eliminated. Pilots, and astronauts in particular, do not now look for landmarks while sitting in an airstream which might blow their glasses off. Color vision may be very important, and might reasonably be made a prerequisite, but it seems quite inappropriate that eye defects which can be corrected with ordinary eyeglasses should be cause for exclusion.

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Antibiotics: The Duplication Problem

The New York *Times* of 18 January carried a story from Moscow entitled, "Russian takes to task discoverers who aren't." This story, quoting *Izvestia*, deals with the competition for a high intellectual prize in the Soviet Union