years, and the annual number of readers 200 per cent., from 400,275 in 1911 to 1,225,778 in 1922. Cost of operation advanced 113 per cent. in the same period.

THE *British Medical Journal* states that the announcement is made from Canada that 2,715 claims have already been received for the prize of $100,000 offered by Lord Atholstan, of Montreal, for the discovery of a cure for cancer; claims have come from forty-one different countries. It is pointed out, however, that claimants must satisfy a recognized medical faculty or leading medical society in his or her own country first that there is some scientific basis to justify the experimental investigation of the professed cure, and that any cases said to have been successfully treated were in fact cases of cancer.

UNIVERSITY AND EDUCATIONAL NOTES

SUBSCRIPTIONS to the Harvard endowment fund reached a total of $13,892,605.29 on January 1, according to figures now made public. Of the sum, $10,910,825.31 had actually been paid in on that date, against a corresponding figure a year earlier of $9,776,706.89.

A BEQUEST of $200,000 for the establishment of a department of clinical surgery has been ordered paid by trustees of the estate of Edward A. W. Hunter to the University of Pennsylvania by Judge Thompson in the orphans' court. The fund awarded the university will establish the "Agnew and Hunter Department of Clinical Surgery" in memory of Drs. D. Hayes Agnew and Charles D. Hunter.

A BILL now pending in the Texas Legislature provides for an appropriation of $200,000 for the establishment of a State College of Technology and Textile Engineering.

J. LEIGHTON STUART, president of Peking University, has announced a contingent gift of $75,000 by the China Medical Board of the Rockefeller Foundation. Mr. Stuart recently arrived in the United States to speak in the interest of a campaign to raise $1,000,000 necessary for the removal of the university from its present temporary quarters to its new site by September, 1924.

DR. WALLACE W. ATWOOD, president of Clark University, who was granted a three-months' leave of absence by the board of trustees to visit Europe, has returned. He visited universities and colleges in Scotland, England, Belgium, Germany, Holland, France and Switzerland. He made engagements with several scholars to occupy the visiting professor's chair in geography at Clark for six months or a year.

E. A. MILLER, formerly field agent for the states relations service, United States Department of Agriculture, who for the past four months has been professor of rural economics and sociology in Oklahoma Agricultural and Mechanical College, has been named director of the Extension Division of the college, succeeding W. A. Conner, whose resignation became effective on January 1.

DR. ROBERT A. LAMBERT, assistant professor of pathology and bacteriology in the Yale University School of Medicine since 1919, is severing his connection with the university to assume the professorship in the department of pathology at São Paulo, Brazil. The chair is filled by an appointee of the Rockefeller Foundation, the professor of pathology being a member of the faculty of the school, and in academic matters to be under the direction of the dean, but appointed in cooperation with the Rockefeller Foundation.

DISCUSSION AND CORRESPONDENCE

RESEARCH IN MARINE BIOLOGY

TO THE EDITOR OF SCIENCE: Under the above heading Professor W. J. Crozier[1] has recently advocated a permanent marine biological laboratory in a tropical or semitropical situation, as a continuation of the work of the Department of Marine Biology, Carnegie Institution, so ably directed by the late A. G. Mayor. Dr. Crozier's letter seems to be a special plea for a subtropical institution. Some of his arguments, however, will not hold water. He says:

> Those whose varied experiences have provided an adequate background for judgment in this matter are unanimous in the conviction that the most suitable locations are to be found on the shores of tropical or semi-tropical seas.

[1] SCIENCE, December 29, 1922, p. 751.

Supreme variety and abundance of animals, ease of access to them throughout the year, a comparative isolation conducive to their scholarly and productive treatment—these can be found only in the warmer seas.

I am not of course informed as to whose unanimous opinion Dr. Crozier refers, but certainly nothing is more erroneous, without severe qualification, than the statement that supreme variety and abundance of animals with ease of access to them throughout the year can be found *only* in the warmer seas. Omitting possibly certain special Pacific localities, disqualified by distance and difficulty of access, there are few groups of marine animals which are not more abundantly represented on our Pacific coast (south, say, to Point Conception) than in the Bermudan-West Indian region which Dr. Crozier may have in mind as being especially favored. I speak of intertidal and very shallow water species, easily accessible. As a matter of fact the west coast fauna is phenomenally rich, being characterized in many cases by an extraordinary abundance of individuals. No warm waters can, of course, hold a candle to the luxurious marine flora of the Pacific coast.

Visiting biologists at Monterey profess themselves astounded at the wealth of shore life—the multitudes of anemones (of eight or nine species), sea urchins, sea stars, bryozoans, annelids (the largest a yard long and an inch or even more in diameter), flatworms, nemerteans, sipunculids, mollusks (consult Dall's lists), crustacea, compound ascidians. The Asteroid fauna of the west coast of North America is the richest in the world. It would be difficult indeed to offset in a West Indian locality the fifty-odd species of Monterey chitons (the largest upward of fifteen inches long), or the ninety-five species of Monterey hydroids, or the variety and abundance of pagurids. We even have a coral which is as tough as the West Indian are tender! Off shore, especially in summer, pelagic life is rich. The same story is repeated further north, notably in the Puget Sound-Vancouver Island region, very accessible.

One who is thoroughly familiar with our Pacific coast littoral finds the intertidal and shallow-water faunas of such islands as Barbados and Antigua disappointing. I understand, however, that Jamaica is somewhat better favored.

An important consideration, easily overlooked, is that few people can work *efficiently* in the tropics for more than short periods. The climate of the Tortugas, and even of Beaufort, I am informed, is very "trying" in summer. The zone of highest mental efficiency is certainly not tropical. Furthermore, in cold waters it is relatively easy to keep animals alive in aquaria and to rear eggs and larvæ. In tropical waters it is difficult. I am informed that at the Tortugas laboratory this was especially true.

Dr. Crozier rightly deplores the unavoidable fact that "the splendid material possessions of the Woods Hole Laboratory . . . are as good as wasted, so far as research is concerned, during eight or nine months of the year." He further states that "the plain fact of the matter is that the existing American institutions for research in marine biology are either more or less unfortunately situated, with regard to climatic conditions or otherwise, or else overburdened in their potentially productive seasons by the requirements of elementary instruction—necessary work, and I speak of it only with respect; but it is not enough."

In his zeal for warm seas, I fear Dr. Crozier has inadvertently overlooked two modest California institutions—the Scripps Institution for Biological Research at La Jolla, and the Hopkins Marine Station of Stanford University at Monterey Bay, both of which are in operation twelve months each year, and certainly are advantageously situated (each in its somewhat different field) as regards accessibility, climate and materials. Monterey, of course, has much the colder water—a predominantly northern fauna. Dr. Conklin stated in conversation (I write from memory) that he had never seen anywhere richer collecting. Need I mention that the climate is never uncomfortably hot, and that irises bloom in the station grounds at Christmas?

Let us by all means have a permanent laboratory, sponsored by the Carnegie Institution, but not in semitropical regions, nor in extra-territorial waters, where a war might hamper or terminate the work. If we are to go in for efficiency, let the location be chosen frankly on its merits, as regards: (1) abun-

dant, accessible, usable fauna and flora; (2) accessibility of station; (3) climate—on a basis of working efficiency during *entire* year; (4) economy in operation.

Organized research in the tropics for a definite purpose is admirable. All honor to Mayor for the splendid work he so indefatigably directed; but let us not take too easily for granted hasty generalizations concerning the superiority of the tropics or subtropics as a situation for a *permanent* marine biological laboratory. There is a glamour about the tropics which is too frequently dissipated on close acquaintance.

W. K. FISHER

HOPKINS MARINE STATION

THE MOVEMENT OF THE CENTRAL ATLANTIC RIDGE

THE soundings in the Central Atlantic area show the existence of a long ridge, which passes through the Azores and the islands of St. Paul and Tristan da Cunha. This ridge shows a bending-point in the neighborhood of the equator between the island of St. Paul and the Romanche deep.

We have pointed out in some recent publications that many of the transverse fractures which often are found near the bending-points of moving geanticlines are the surface expression of differences in rate of horizontal movement. In moving rows of islands several deep straits between the islands coincide with bending-points.

Transverse faults with a horizontal displacement are sometimes visible and where the epicenters of modern earthquakes are on transverse tectonic lines near the bending-point, similar movements are still going on at the present day.

In regions which are not accessible for direct observation, the comparative tectonic method should be applied. If a submarine ridge has a bending-point, the form of the ridge can be the result of differences in rate of movement of neighboring points in the horizontal projection of the ridge. Where the differences are greatest, epicenters of earthquakes will be numerous and if a submarine ridge shows a maximum of seismicity in the neighborhood of a bending-point, this points to movements with unequal velocity in a horizontal direction. The central Atlantic ridge shows a bending-point near the equator and a zone of high seismicity is found in the neighborhood between the island of St. Paul and the Romanche deep. The deeps in the same neighborhood, which are an abnormal feature for the Atlantic sea-bottom, may be in part of similar origin as the abnormal deep straits near bending-points of rows of islands.

The long ridge of the Central Atlantic area has been explained in several different ways, *f. i.*, as the beginning of a zone of arcuate folding, as the highest parts of a subsided continent, as a ridge of volcanic origin and as the filling of an originally narrow gaping fracture which opened to the present Atlantic Ocean by horizontal movement of continental areas.

The application of the comparative tectonic method points to movements with unequal velocity in a horizontal direction, which may have been going on since a very long time. The present S-shaped ridge may have developed from a simpler form by similar movements as those which characterize the present ridge. Anyhow, those explanations in which the horizontal movements are not taken into consideration do not seem to be applicable.

H. A. BROUWER

DELFT, HOLLAND

JANUARY 10, 1923

THE DEPRECIATION OF THE POUND

TO THE EDITOR OF SCIENCE: Advocates of the metric system will be interested to know that, beginning January 1, 1923, all transactions in grain, meal, bran, potatoes and agricultural seeds in the United Kingdom will be conducted on a price per hundred weight of 112 pounds. This is in conformity with the provisions of the Corn Sales Act of 1921. After December 31, 1922, any contract, bargain, sale or transaction in above named staples will be null and void unless made by weight only and in terms of or by reference to *the hundred weight of 112 pounds.*

Thus a step forward has been taken; but at that only a halting one. The pound is no longer 7,000 grains but only 6,250 grains because a pound now is by law only nine tenths of a pound. Dealers in farm products in Great Britain will still use the short ton and the long ton; but seemingly, the stone, the box,