1800 and 1870, and three out of six show increases between 1870 and 1927. The changes at Gogīpatri and Poshkar, which are situated 15 miles apart, are directly contradictory. It can only be concluded that all the changes may be attributed to errors of observation or of star place, and that there is no evidence of continental drift. Nor, on the other hand, is there any disproof of the existence of a drift of the order of fifty feet per century.

The latitude and longitude data for India indicate very clearly that there is no rapid movement of that country in a north and south or an east and west direction. There is no possible way to tell whether or not there is a very slow drift. It will take another century or more, with repeated astronomical determinations of latitude and longitude, to get any clear idea as to the stability or instability of the Indian region. It is interesting, however, to have the valuable evidence contained in the report from India.

WILLIAM BOWIE
U. S. COAST AND GEODETIC SURVEY

ANTAGONISM BETWEEN ZOOPHARMACOLOGY AND PHYTOPHARMACOLOGY

DR. DAVID I. MACHT has presented an interesting review of cases of the dissimilarity between the zootoxic and the phytotoxic action of various alkaloids and toxins.[1] To quote from his article:

> It has been the experience . . . that poisons produced by plants, or phytogenic poisons, are more toxic for animals than for plants, while poisons elaborated or produced by animals, or zoogenic poisons, are commonly much more toxic for living plant protoplasm than for living animal tissues.

It would be possible to extend this idea of an antagonism between animals and plants to the subject of diseases and their treatment. If we consider the bacterial diseases of animals as diseases in which a plant (the bacterium) is infecting an animal host, we find that these diseases are, as a general rule, virulent. The infecting organism does not show any compatibility with the host, and produces various highly toxic substances (the bacterial toxins) which circulate in the blood stream and very rapidly bring the disease to a crisis from which the animal either dies or recovers. In the case of recovery, we find a very marked protective reaction on the part of the animal host, as indicated by the production of various immunological substances, the antitoxins, bacteriolysins, agglutinins, opsonins, etc. The net result is either that the plant (bacterium) kills the animal, or that the animal kills the plant. We have, therefore, in this case, no compatibility between the two forms, but instead a marked incompatibility.

[1] SCIENCE, 71: 302–306, March 21, 1930.

When we consider the infestations of an animal host with animal parasites, we have a markedly different picture. The host and parasite live together without any marked protective or offensive action on the part of either. When death occurs in these conditions, it is a result of the gradual destructive action of the parasite on some particular tissue of the host. The tapeworm, the liver fluke, the malarial plasmodium, the trypanosome, the filaria worm, the spirochete and the intestinal ameba may be taken as examples of this type of infesting organism. These organisms do not produce any great amount of toxins, and do not stimulate the host to form any great amount of protective substance. The host and parasite are seemingly quite compatible, and live together in what might be called a semi-symbiotic relationship, until gradually the infesting organism produces enough organic damage to the host to interfere with normal function. These diseases are, therefore, of a chronic type as compared with the virulence of the bacterial diseases.

This antagonism between animals and plants is reflected in the treatment of our diseases. If we wish to cure a bacterial disease we either let the patient prepare his own defensive substances (let the patient get well), or we make use of the same defensive substances prepared by another host (the antitoxins). Ordinarily, treatment and medication are valuable only in so far as they make for the physical welfare of the patient. If we wish to cure our infestations with an animal parasite, we must make use of various plant extracts (quinine and emetine are examples), or resort to the preparation of synthetic chemotherapeutic agents. The patient is practically entirely powerless to cure the disease completely, although he may reach an equilibrium with the parasite, in which the disease is to all intents latent, but from which condition the disease may later flare up and the patient suffer a relapse.

We may, therefore, entrust the treatment of bacterial infections to the patient, the physician or the bacteriologist and immunologist, knowing that their efforts will be assisted by the natural antagonism between the host and the infecting organism. In the parasitic infestations, the host, the physician and the parasitologist can do no more than describe the disease. The cure of the disease must be sought for in the growing field of chemotherapy.

EDWIN H. SHAW, JR.
BIOCHEMISTRY LABORATORY,
UNIVERSITY OF SOUTH DAKOTA

TEREDOLITHUS, A NEW COLLECTIVE GROUP NAME

QUITE a number of fossil ship worms have been described under the generic name Teredo. Most of these names were based upon fossil woodborings or the lining of burrows and occasionally upon shells. These parts without the pallets unfortunately do not furnish characters which are at present considered of prime importance in ship worm classification.

Recent studies of the living species have demonstrated that ship worms, like other bivalve mollusks, have restricted ranges, and this knowledge will undoubtedly be used by paleontologists in dealing with fossil species, which will result in the description of many new forms in the future.

Since the classification of recent species is now quite well established it seems a pity to burden the rather limited group Teredo with the many specific means which no one can at present place in their proper genus. It is for that reason that I now suggest the collective name Teredolithus for the reception of these generically indeterminate species of ship worms. This name is not to be considered a genus in the accepted sense, but a convenient repository for such species as we find at present generically indeterminable. This name is to have no type, and therefore continue in use as long as generically indeterminate ship worm species exist.

The splendid precedent for a somewhat similar procedure was established by Dr. Stiles in 1907, when he created the name Agamofilaria for the reception of species of Filarids based upon larval forms which failed to furnish the characters for proper generic designation. This group name has served and is still serving a useful purpose as a more or less temporary resting-place for immature Filarids.

Some of the American fossil ship worms which should be placed under Teredolithus are: *Teredo calamus* H. C. Lea, *T. circula* Aldrich, *T. dendrotestes* Brown and Pilsbry, *T. emacerata* Whitfield, *T. fistula* H. C. Lea, *Kuphus incrassata* Gabb, *Teredo mississippiensis* Conrad, *T. pugetensis* White, *T. simplex* Lea, *T. substriata* Conrad, *T. tournali* Leym. and *T. virginiana* Clark.

PAUL BARTSCH

U. S. NATIONAL MUSEUM

DISCOVERY OF PHOSPHORUS FIXING COMPOUND IN THE SOIL

THE Louisiana Experiment Station has found an iron compound in southern soils which is responsible for the fixation of phosphorus. In the poorly drained soils the compound exists as concretions, ranging in size from below the visibility of the naked eye to fine gravel. In the well-drained soils, the concretions are not so much in evidence.

The concretions usually consist of a series of smaller ones. They are black in color, and when wet are rather soft. The structure is very open, and when the concretions are placed in water they emit a singing noise due to escaping air.

The physical structure of the concretionary material is such that it forms a very reactive compound. It appears that the phosphorus in this compound occurs as a basic ferrous phosphate. Drainage apparently determines whether the basic ferric or basic ferrous phosphate occurs.

The solubility of this phosphorus compound is exceedingly low, about .2 ppm. PO_4 in a .002 N. H_2SO_4 acid solution. As the amount of PO_4 varies in this basic compound it is likely that the solubility also varies. The effect of saturating this compound with PO_4 on the solubility is being studied, as well as various other soil treatments.

A. H. MEYER

LOUISIANA STATE UNIVERSITY

THE BANANA IN EARLY BOOKS: FRUIT OR STEM?

IN a paper[1] published recently I made the statement that the banana, as known to-day, existed in India before the Christian era, but further examination of the evidence makes me less sure of that conclusion. The earliest record, Megasthenes (303 B. C.), refers to a banana, but speaks only of the pseudostem as being eaten. The frescoes of Ajantâ (400 B. C. to A. D. 700) show unmistakable banana plants, but a careful examination has failed to discover any pictures of the fruit, although the mango, lime, custard apple, aubergine and other fruits are clearly illustrated. It seems probable, therefore, that the stem and not the fruit of this banana was eaten. I had previously accepted Pliny's interpretation of Theophrastus' statements as probably referring to leaf, flower and fruit of a single plant but am now inclined to take a more literal translation. In that case only the second "*Ετερον δέ οὐφὐλλον . . . ,*" that referring to the leaf, can positively be connected with the banana. Ibu Serabi says, "Musa. Abēmesuai ē calm ē medio primi grad' humidū ī fine eius nutrit par," and Ibu Sina, though using the name Musa, does not say whether the fruit or stem was eaten. It is not until 1563, with Garcia da Orta, of Goa, that I find the fruit of the banana definitely referred to as being eaten. I can not accept Rung's[2] evidence of its existence in pre-Christian Egypt as convincing, for his figures may represent hands of bananas but look at least as much like bundles of faggots tied together. The evidence of its existence in America is even less convincing. It seems evident that the Physocaulid bananas, *Musa Eusete, M. glauca,* etc.,

[1] Philip R. White, "Studies on the Banana," *Zeitschrift f. Zellforsch. u. mik. Anat.,* 7: 673–733, 1928.

[2] Richard Rung, "Die Bananankultur," in J. Perthe's "Geog. Anstalt," Bonn, 1911.