face which to this day retains the impact basins resulting from their fall.

Lying unconformably beneath this relatively recent material and separated from it by erosion surfaces and in some cases thin lava flows, we find the deposits of two apparently separate eruptions which we designate as second and third in the series. They were both characterized by the ejection of quantities of volcanic ash, concentrated about the northeast and southeast quadrants of the crater respectively and extending some three or four miles beyond the rim so far as appreciable deposits are concerned. The older of the two started with a small amount of fine ash and then with quantities of the thread-lace scoria of the most perfect type and a peculiar type of dumb-bell and Indian-club droplets; so far as known formed only at this time, probably because of some peculiar consistency of the magma. This deposit is that seen about the Volcano House and the roadway leading east and west. In the crater itself the deposit attains a thickness of twenty-five to thirty feet. Wherever observed the basal layer was found to carry more or less of the perfect type of thread-lace scoria, quite readily distinguished under the magnifier from that ejected in 1789, as well as the recent samples collected by Jaggar from Mauna Loa. This eruption closed as did that of 1789 with the discharge of many volcanic blocks, large and small, directed mainly to the northwest for a distance of two to three miles from the rim. Superficial field observations indicate that these blocks have been longer exposed to the weather than have those of 1789, and that they bear a relationship to the dike material found in the adjacent crater wall.

The deposits of the third eruption of the series are for the most part fine and very perfectly stratified. Bombs and blocks are rarely seen and no limu or droplets characterize the sections. The eruption began apparently with the ejection of a black sand, which fell upon a weathered and rusted surface of pahoehoe. This was followed by clouds of fine dust, attaining a maximum thickness about the southeastern quadrant of the crater of some forty-five feet. Along the extended minor, or east-west axis of the crater, these deposits overlap those of the second eruption, if we are justified in attaching correlation value to the true thread-lace scoria. However, in the crater they are much more firmly indurated than the latter, through the action of steam and other gases and hence have the appearance of greater age.

During certain stages of this eruption, as well as that of the second and fourth in our series, rain drops falling through the hot, dust-laden atmosphere became completely charged with the fine dust, arranged in concentric shells and slightly cemented and dropped into the soft ash layer beneath without undergoing appreciable distortion. Some of these are still firm enough to be rolled along and segregated like pebbles by temporary rills. Similar bodies fell abundantly in the vicinity of Naples on the morning of April 8, 1906, Vesuvius being then in eruption (Bassani and Galdieri). Specimens from Kilauea were photographed by Perret in 1914 and referred to by Friedlander under the term "pisolites." Is there any serious objection to calling them fossil rain drops? During the closing stages of the second eruption these pellets grew to the size of one's thumb, as in the case of ordinary hail stones, as suggested by Lane, and were slightly flattened by their fall or possibly manner of formation. To the west and northwest of the main crater, beyond the limits of the coarser debris, these remarkably preserved structures may be collected by the bushel.

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SCIENTIFIC EVENTS

THE PI MU EPSILON MATHEMATICAL FRATERNITY

IN these days of the extreme emphasis on and acclaim accorded to athletic prowess, it was but natural that scholars in their different fields should establish honors and emoluments for the recognition of mature and successful scholars and for the encouragement of younger aspiring scholars that should challenge, encourage and reward their intellectual prowess. Among such means of honor and encouragement are honorary national fraternities in special fields of scholastic endeavor. The basis of membership in these fraternities is scholarship.

It is not surprising therefore that such a national fraternity has been established for mathematicians. This fraternity had its birth at Syracuse University. The Mathematical Club of Syracuse University was organized in 1903. After it had had ten years of successful existence, it was entirely reorganized and became the first chapter of the Pi Mu Epsilon Mathematical Fraternity, which was founded at Syracuse University and incorporated on the twenty-fifth of May, 1914, at Albany, under the laws of the state of New York. "Pi Mu Epsilon is an academic fraternity in institutions of university grade," says the constitution. Its primary aim is the advancement of mathematics and scholarship. While its members are elected entirely on the basis of scholarship in mathematics and other subjects, it is not merely an honorary fraternity in that election to membership is all there is to it. It is a living, active, working fraternity of scholars, in which the members are actively engaged in study and research in the preparation of papers in the field of mathematical science to be presented at its regular meetings.

The following classes are eligible to membership in Pi Mu Epsilon: Any one whose work in the mathematical sciences is distinguished; members of the mathematical faculty; major and minor graduate students of mathematics; any former graduate whose work in mathematics was or is distinguished; major and minor undergraduate students of mathematics who attain the standard of scholarship set by the fraternity for eligibility to membership of such undergraduates.

One of the features of the fraternity's activity is the preparation on the part of each chapter of a circular letter to be sent to all the chapters at least once a year, and containing items of interest concerning its work and programs and list of officers, in order that, according to the constitution, "the chapters may realize the benefits of that fraternal interaction and stimulus, which was one of the reasons for founding the fraternity."

The fraternity now has six chapters, in the order of their installation, at Syracuse University, Ohio State University, University of Pennsylvania, University of Missouri, University of Alabama, Iowa State College of Agriculture and Mechanic Arts.

The national officers of the fraternity are: *Director general,* Professor E. D. Roe, Jr., Syracuse University; *vice-director general,* Mr. William V. Houston, Ohio State University; *secretary general,* Professor Warren G. Bullard, Syracuse University; *treasurer general,* Miss Louisa S. Lotz, University of Pennsylvania; *librarian general,* Miss Mabel G. Kessler, University of Pennsylvania.

E. D. ROE, JR.

THE ARNOLD ARBORETUM OF THE HARVARD UNIVERSITY

THE committee appointed by the Board of Overseers of Harvard College to visit the Arnold Arboretum has issued the following statement:

The arboretum was established fifty years ago as the university's museum to increase the knowledge of trees and shrubs, of which it has now the largest living collection in America, supplemented by a great herbarium and library, and is everywhere recognized as the most important institution of its kind in the world, and also as one of the most beautiful of all public gardens. For forty years it has been the most active and successful of the agencies for the discovery and study of new trees and shrubs; and to-day it is a great national institution of world-wide usefulness and reputation, to whose initiative and example the parks and gardens of America owe much of their beauty.

The arboretum has outgrown its endowment, which produces only $40,000 a year, and to meet the deficits of income the director has been obliged for a long time personally to raise every year from forty to fifty thousand dollars, which have been given usually by not over one hundred and twenty persons chiefly living in Greater Boston. A still larger income will be required if the arboretum is to broaden its influence and maintain its position. Professor Charles S. Sargent has been director of the arboretum for fifty years, and it is time that he should be relieved of this burden of money-raising.

A national institution is entitled to national support. Will you not contribute $10 or such larger sum as you feel able to give for the work of the arboretum? Every contributor will receive in return the arboretum's *Bulletins of Popular Information,* containing information about all new and interesting plants, the illustrated guide to the arboretum, if desired, and any assistance and advice about his own plants that can be furnished by correspondence.