ISOPLETH

IN SCIENCE for July 13, Professor Lane tells of his need for a generic name for the lines used on maps to show equal values for various phenomena. He suggests that we make "isontic" the name for the genus that includes such species as "isobar," "isochlor," "isogam" and "isotherm."

I do not know how wide-spread the word "isopleth" may be. The "pleth" root refers to the plethora or degree of fulness in some respect. It is used by Huntington and Williams on page xii of the second edition of their "Business Geography," and elsewhere. I think that I have seen the term used by others, but I do not find it in my big Webster.

I dislike "isontic" because it sounds to me like an adjective instead of a noun. Besides, why make another name when there is a good one already?

HAROLD S. PALMER
THE UNIVERSITY OF HAWAII

GENERAL FACTORS IN A TABLE OF INTERCORRELATIONS

IN studying the intercorrelations of a group of character traits, the following technique was developed. It seems of such general application in constructing a battery of tests that it should be made available at once to those interested in this field. The steps in the method are as follows:

(1) Construct a table of intercorrelations of the tests according to the usual method.

(2) Pick out the group of tests having the highest correlations with one another, and by Spearman's formula ("The Abilities of Man," Appendix, p. xvi) determine the correlation of each of the tests with the supposed general factor.

(3) Take this general factor as the criterion and, having its correlations with the specific factors and also the correlations of the specific factors with one another, work out the multiple correlation of the specific tests with the general factor. Weight the individual tests and obtain the regression equation.

(4) Using the regression equation for two or more general factors, *e.g.*,

$$\frac{X_0 - M_0}{\sigma_0} = \beta_{01.2}\left(\frac{X_1 - M_1}{\sigma_1}\right) + \beta_{02.1}\left(\frac{X_2 - M_2}{\sigma_2}\right) + \cdots + \beta_{0u(c-u)}\left(\frac{X_u - M_u}{\sigma_u}\right)$$

correlate the general factors according to the simple formula

$$r = \frac{1}{N}\Sigma\,\frac{x}{\sigma_x}\cdot\frac{y}{\sigma_y}.$$

When this technique is employed, a number of tests with relatively high correlations may have to be discarded because their regression coefficients approach zero. Retaining only those with significant regression coefficients, we have so far found that, for the groups studied, Spearman's tetrad difference criterion holds and also Dodd's coefficient of equiproportion. Before eliminating the tests with zero regression coefficients, there were several high partials that disturbed the coefficient of equiproportion.

One advantage of the technique is that in constructing a battery of tests it settles the problem of the criterion and allows the determination of weights for all the tests, including the specific test which might have been available, according to the ordinary method, only as a criterion.

M. ROSA MCDONOUGH
CATHOLIC UNIVERSITY OF AMERICA

QUOTATIONS

THE ELGIN BOTANIC GARDEN

WHEN John D. Rockefeller, Jr., leased the "Upper Estate" of Columbia University for a great public improvement it was recalled that the land involved included a large part of the Elgin Botanic Garden, which was started in 1801 as a private enterprise on twenty acres of land which Dr. David Hosack bought of the city corporation for $4,807.36 and "a quit rent of sixteen bushels of good merchantable wheat to be paid every May in kind, or its equivalent in gold or silver." Dr. Marshall A. Howe, assistant director of the New York Botanical Garden, prints in the journal of that institution for March an interesting sketch of Dr. Hosack's enterprise, which eventually conferred on New York State its first publicly owned establishment of this nature.

Dr. Hosack was professor of botany at Columbia, and he labored unsuccessfully to induce the college, and later the state, to found a botanical garden. When he realized he could not accomplish this, he bought "nearly twenty acres of land" between the present Forty-seventh Street and Fifty-first Street, west of the Middle Road—now Fifth Avenue—a site then described as "distant from the city about three miles and a half." Dr. Hosack labored diligently in the garden, but eventually the burden of maintaining it became more than he felt he could bear. After much negotiation, in which he had the support of the County Medical Society, the governors of New York Hospital, the Mayor and Common Council, he succeeded in inducing the state to buy it under the provisions of "An Act for Promoting Medical Science

in New York," the price of land and buildings being set eventually at $74,268.75, a sum less by $28,000 than the total of Dr. Hosack's investment and disbursements with simple interest computed at 6 per cent.

The state confided the administration of the garden to the regents of the university; the regents passed it along to the College of Physicians, disclaiming any responsibility for the cost of its upkeep. In 1814 the Legislature granted title to the land to Columbia College in legislation requiring the college to move within twelve years to this site or to one near by. The college did move up town, but not until 1857, when it went to Madison Avenue and Forty-ninth Street. By that time the Elgin Garden had become valuable, though the price its lease would eventually bring was not dreamed.

Dr. Howe says that the Elgin Garden was "apparently the first in America to come under public ownership." Its name was derived from the Scotch town in which Dr. Hosack's father was born. Thus the latest great improvement in New York links up with an earlier one. Perhaps Mr. Rockefeller will find a way to preserve the ancient name in his modern development.—*The New York Times.*

SCIENTIFIC BOOKS

The Fishes of Oceania. By HENRY W. FOWLER. Pp. iii + 540, quarto, 82 figs., pls. I–XLIX. A faunal treatise on the fishes around and upon those island groups of the Pacific Ocean known as Polynesia, Micronesia and Papua. Memoirs of the Bernice P. Bishop Museum, Vol. X. Published by the museum, Honolulu, 1928.

STUDENTS of Pacific fishes have for years been obliged to consult the works of many authors in order to approach the subject as a whole. Bulletin of the U. S. Fish Commission, Vol. 23, 1903, "The Shore Fishes of the Hawaiian Islands, with a general account of the fish fauna," by Jordan and Evermann, has been the chief reliance for that archipelago, as has Jordan and Seale's "Fishes of Samoa," U. S. Bureau of Fisheries, Bull., Vol. 25, 1905, for that group. Pieter Bleeker's remarkable volumes issued between 1861 and 1878 revealed the colorful wonders of Papuan fishes. The long-felt need of a comprehensive work seems largely to have been met by the present memoir. This is really the corner-stone to a series of five volumes, now in preparation, on the colossal albatross collections in which the author plans to monograph the entire Indo-Pacific fish fauna.

His long experience in taxonomic work upon the world's fishes, his recent examination of the large Pacific collections in the Bishop Museum, in the Museum of Comparative Zoology and in the U. S. National Museum, in addition to those which he and his predecessors have brought together in the Academy of Natural Sciences of Philadelphia, have enabled Mr. Fowler, with access to a large body of literature, to establish upon a broad basis the distribution and relationships of the fishes composing this rich Oceanian fauna. His treatment, on the whole, is conservative, an aspect which will gratify many workers. At the same time his comprehensive synonymy should appease the "splitters." In a faunal work such as this he regards the purely taxonomic questions as largely secondary. The sequence of families followed is that of D. S. Jordan, 1923.

From the time of the early voyagers and discoverers the vivid coloration and variety of Pacific fishes have attracted attention, but extensive collections must be made in many more localities before much can be known of the distribution of many species. Ignorance of distribution sometimes leads to the description of questionable new species. "Although many sections, such as South Africa, East Africa, the Arabian Sea, the Bay of Bengal, the China Sea, the East Indies, the coasts of northern Australia, Melanesia, Micronesia, Polynesia and Hawaii may be defined more or less loosely as major faunal subregions, there still remains a large element of homogeneity in distribution." To illustrate the Indo-Pacific measure of the Oceanian ichthyfauna, the author has listed 445 species—a very small proportion of those actually known from Oceania—which range from East Africa or the western Indian Ocean well into Polynesia.

All the records discoverable of over 2,000 species, representing 179 families, appear, together with complete synonymy and references to literature containing them. Type locality is given with the original reference. In the cases of species for which material was not available for Oceania, Fowler has furnished diagnoses, usually brief, compiled from original or trustworthy descriptions.

Eighty-two excellent drawings, many of them depicting young stages, appear in the text. In preparing the plates 108 of the remarkable colored fish models in the Bishop Museum were photographed. A bibliography of 170 works and a 47-page index are provided.

And with all this the author estimates that probably not much more than half of the species inhabiting Oceania have yet been described, regarding his present volume as "only a contribution to the ichthyfauna of that vast ocean expanse."

That this publication is intended chiefly for ichthyologists may be inferred, if only from the complete absence of popular names, either English or native.

S. C. B.