symbol was initiated by Pearson in 1894.[6] It was not used by Galton or Edgeworth. Ordinarily no confusion arises from the double meaning, but sometimes, as when the standard deviations of reaction-times are under consideration, there may be very real difficulty. Cattell seems to have antedated Pearson by nine years, but of course Wundt's and Galton's schools did fuse until comparatively recently.

There is no proposal for reform that I wish to make, unless it be that the word *millisecond* might be used more and the symbol σ less. I can not help wondering what others think about this matter.

EDWIN G. BORING

HARVARD UNIVERSITY

PEDOGRAPHY

IT is obvious that the students of soil science are not agreed on the term they will use for their division of natural science. There has been a trend toward the word *pedology,* but in some circles there is a protest because the term is now being used by a limited section of the medical profession.[1] It has been pointed out that *paedology* or *paidology* is the word which should be used by the medical profession.[2] The pronunciation of the two will be essentially the same, but this need not cause confusion. Furthermore, Brown[3] has pointed out that pedology was first used by the Russian soil scientists in 1865.

The term pedology has been presented to a larger audience than the students of soil science by the publication of Wolfanger's little book called, "The Major Soil Divisions of the United States."[4] He uses not only pedology, but several other words having the same root. These terms are: pedologist, pedologic, pedological, pedalfer, pedalferic, pedocal and pedocalic. The subtitle of his book is "A Pedologic-Geographic Survey." Since he has placed considerable emphasis upon the distribution of the soils, it is suggested that *pedography* be added to the list, and that the term shall have as its connotation the geographic aspects of soil science. How simple the title of Wolfanger's book would have been as "The Pedography of the United States"!

Geographers are frequently on the receiving end of jibes from the followers of the so-called pure or natural sciences, who imply that they are not contributors but borrowers. Whether or not this criticism is justifiable I will not debate, but assuming that there is a borrowing, it becomes imperative that the students of soils come to some agreement as to what they will call their division of science, for the geographers will borrow, and the success of the borrowing depends in a large measure upon the progress of pedology. In defense of the borrowers it is necessary to insist that the material selected should have some habitat significance. The student of modern geography is not qualified to undertake a regional analysis unless he has a rather systematic knowledge of the physical environment, and certainly soil is an important element in most parts of the world. Huntington and Carlson's "Environmental Basis of Social Geography"[5] is one of the first text-books of geography to treat soils according to the attributive system.

Geographers are generally agreed that climate is the most important element of the physical environment. The science of climatology is an important part of the training of a geographer if he is to understand the environment. The geographical distribution of climates or climatic types is of major importance, and here and there in the literature of geography and climatology appears the term *climatography* which connotes regional or geographical climatology.

If climatography is appropriate for that division of climatology which treats of regional climate, so pedography may be used for that division of pedology which treats the geographical distribution of soils.

The purists may insist that pedography should connote simply a description of soils, but geography is not a descriptive science simply. Just as geography, as an exact or social science, has become interpretative, so pedography may be considered as that division of soil science that treats of the regional distribution of soils. Pedology, then, may be concerned chiefly with the vertical attributes of soil types, and pedography with their distribution and delineation.

GUY-HAROLD SMITH

DEPARTMENT OF GEOGRAPHY,
OHIO STATE UNIVERSITY

OVERHEAD

RECENTLY I wrote a paper on the carpenter bees of the Philippine Islands and sent it to the Philippine Bureau of Science for publication. It was typewritten in Manila, and on November 21 Mr. R. C. McGregor sent me the typed copy for verification before printing. The package reached me on January 10 through the War Department, postmarked Washington, D. C. The letter accompanying it was endorsed as follows:

[6] K. Pearson, *Philos. Trans.*, 185A, 1894, 80. Dr. T. L. Kelley writes me that Dr. H. M. Walker also finds this place to be the first use of σ for the standard deviation.

[1] See W. A. Hamor's note in SCIENCE, 71: 70, January 17, 1930.

[2] See P. E. Brown's note in SCIENCE, 71: 243, February 28, 1930.

[3] *Ibid.*

[4] Published by John Wiley and Sons, Inc., New York, 1930.

[5] Published by Prentice-Hall, Inc., New York, 1929.

(1) November 26, Department of Agriculture and Natural Resources.

(2) November 27, Department of Agriculture and Natural Resources. Respectfully forwarded to the Secretary to the Governor-General, requesting transmittal.

(3) December 4, Office of the Governor-General of the Philippine Islands. To the Chief, Bureau of Insular Affairs, War Department, Washington, D. C.

(4) January 6, War Department, Bureau of Insular Affairs, Washington, D. C. Respectfully transmitted.

Considering all this, the package came through fairly promptly, and I do not suggest that these various offices, organized as they are, are not efficient. I do suggest, however, that all this overhead is senseless and wasteful, and foreign to the spirit which I have come to regard as characteristic of this country.

T. D. A. COCKERELL

UNIVERSITY OF COLORADO,
JANUARY 10, 1930

QUOTATIONS

THE NEW PLANET

AT a meeting of the Royal Astronomical Society on March 14 the report from the Lowell Observatory of the discovery of a new planet was discussed.

The following summary is given in the London *Times:*

Dr. A. C. D. Crommelin, who presided at the meeting, said the occasions when a new major planet was added to the members of the solar system were exceedingly rare and very important. Apart from the "small vermin of the heavens," as the minor planets had been called, there had been only two cases of discovery of new primary bodies in the system—those of Uranus and Neptune. Thursday was the one hundred and forty-ninth anniversary of the discovery of Uranus by Sir William Herschell and that anniversary was marked in a very appropriate way by news of the discovery of another planet.

The telegram, which had been received by the society from America, through the Bureau of the International Astronomical Union at Copenhagen, was as follows (explanatory words interpolated in square brackets):

Lowell Observatory search for trans-Neptunian planet revealed an object of fifteenth magnitude, for seven weeks in rate of motion and path conforming to approximate distance [the late Professor Percival] Lowell assigned. [The position on] March 12 3h. 7 time-seconds west [of] delta Geminorum, agreeing with Lowell's longitude.—SHAPLEY.

The society's foreign secretary had prepared the following telegram, which had been approved by the council:

President, council and fellows of the Royal Astronomical Society, in meeting assembled, send the Lowell Observatory their heartiest congratulations on the great discovery of the trans-Neptunian planet.—TURNER, *foreign secretary.*

Those whose memories extended back over half a century would remember the efforts made both on theoretical and observational lines to find the trans-Neptunian. On the theoretical side a lot of time and great care had been spent in determining the position of a body that would account for the small residuals in the motion of Uranus. Neptune was not used much because it had not been observed long enough to get an exact mean orbit. Lowell thought there were two possible positions, 180° apart, either of which would account for the small residuals he found. The latter of the two, which he probably looked upon as the least likely, now proved to be the one which agreed with the present position. All observers had had great faith in Lowell's prediction, and those at his observatory had spent a long time observing the new planet without saying anything about it. They had been taking photographs along the ecliptic, showing very faint stars, and studying them for changes of position. At last, in the middle of January, they found a body moving slowly in the constellation Gemini. They followed it for seven weeks, and now they had got an orbit sufficient to show that it was outside Neptune and within Lowell's orbit.

Such a planet had been conjectured to exist by a good many people besides Lowell. The study of comet orbits had led to the conjecture of a planet with a period of about three centuries. Another telegram gave an estimate of the size of the body. It was said to be of the fifteenth magnitude and intermediate between that of the earth and Uranus. The exact mean of the two would give a diameter of 19,000 miles, but it was too small for its dimensions to be measured with any accuracy. There was a hope that images of the planet might be found on past photographs. When once the approximate orbit of this body was made out there was very good hope that on the Franklin Adams chart and on the photographs taken at Heidelberg and elsewhere when searching for minor planets this planet would be found.

Professor H. H. Turner, director of Oxford University Observatory, said it was hard that Professor Lowell should have died before verification of the discovery which he felt sure would come had been obtained. His confidence was shown in the fact that he left a legacy for the observatory which he founded to continue the search he had instigated and formulated. It was specially pleasing to find that the discovered planet came out so close to the prediction he made. The honor of the prediction must be shared to some extent with their old friend Professor W. H. Pickering, who, when he was working for Harvard in 1919, made a prediction which was very near to the place.

Dr. J. Jackson, chief assistant at the Royal Observatory, said that, at a rough calculation, the planet in seven weeks should have moved something like half a degree in its geocentric orbit. Now it should move about 30 seconds a day. It was now in the position 7 hours 15 minutes. Lowell's figures for 1914 placed it in longitude 84. That was deduced entirely from the perturbation of Uranus. On that basis its predicted position to-day