environment. So that, in order to know about a single form of life, it is necessary to know about the laws and principles which have governed its origin, evolution, survival and dispersal within its present geographical limits, and its present relations to all other forms of life coming within the same zone of climatic influence. In fact, "to know all about any one thing in nature it is necessary to know all about everything," which, of course is far beyond the capacity of the human mind individually or collectively. When, however, it is known from the accumulation of knowledge and special original research that there are certain fundamental major and minor laws and factors of nature, the effects of which are represented on the surface of the earth by the phenomena of life, seasons, weather and their variation in character or type with geographic distance, and that with the development of a comprehensive system of coordinate bioclimatic elements and of principles and methods of application the records of the bioclimatic elements of any geographic position can be analyzed, the major and minor bioclimatic zones and the zonal, climatic, seasons and weather types it represents can be interpreted. So that a large part of the essential knowledge on which to base specific scientific research on any form of life or any related subject can be made available to the research specialist. In other words, the specalist can take the preliminary interpretations of the fundamental laws and principles, which are represented alike by all of the elements of the local phenomena, and begin his work where his immediate problems of supplying additional information begins.

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PERIGLACIAL PHENOMENA IN THE PUGET SOUND REGION

IN the Arctic and sub-Arctic lands and also in the high mountains intensive frost action produces distinctive structures in the surface soil. These "reticulated" or "cellular" soils have been described from many localities by me and by many other observers.[1] The published discussion of this subject by Bryan[2] and a recent conversation with him have recalled to my attention observations made some years ago in the Puget Sound region. Here on the prairies in the vicinity of American Lake, southwest of Olympia, Washington, are gravel outwash plains of the earlier ice advance. These localities were outside the border of the last (Wisconsin) ice and, therefore, must have endured a periglacial climate. The most significant features are segregations of gravel and soil that have a reticulated pattern. Over large areas the surface is divided into approximately equidimensional patches of soil nearly clear of stones that are separated from each other by narrow strips of gravel and boulders having an open texture and little or no interstitial soil. As a general rule the soil patches stand higher than the boulder septae. In many places the margins of the boulder septae are higher than their centers. Major lines of boulder concentrations persist for long distances and branch up slope in characteristic drainage arrangement. In other words, one accustomed to the Far North finds here, under a present genial climate, a thoroughly familiar set of features, identical in every respect with the products of sub-Arctic frost rearrangement of mixed alluvial materials.

There are also areas in which the gravels are hidden by broad parallel ridges of black soil. These were developed at the time of glacial recession but are not indicative of any peculiarities of the climate of the time. Such ridges are normal forms of deposition from broad sheet-flow of silty or turbid water and are developed as readily in warm climates as in cold. Flood deposits in the alluvial valley of the Mississippi of both modern and fairly ancient origin show these same forms. The unusual dark color of the ridge soils of the Puget Sound region is the result of the growth and decay of the common brake.

The existence near Olympia of reticulated soils that testify to the existence of a Wisconsin periglacial climate should lead to search for other similar phenomena within the area and to further use of such criteria in the interpretation of the earlier glacial deposits along lines of attack similar to that already initiated in the Central States.[3]

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METER IN COMPOSITION

IN the issue of SCIENCE for October 30 is an interesting note by G. S. Fraps on "Hybrid Words." In closing, he says: "The English language would be in better shape if some people knew less Greek and Latin." Perhaps it would be better to say that the English language would be in better shape, if everyone, especially scientists, knew more of these languages and would be more careful and less pedantic in using the very little they usually know. Hybrids of all kinds offend good taste. Even the lovable

[1] "The Yukon-Koyukuk Region, Alaska," U. S. Geol. Survey Bull., 631, pp. 75–82. 1916; B. Hogbom, "Uber die geologische Bedeutung des Frostes," Geol. Inst. Uppsala, Bull., vol. 12, pp. 258–390, 1913; W. Salomon, "Arctische Bodenformen in dem Alpen," Heidelbergen Akad. Wiss. Naturw. Kl. Sitz-Ber., Pt. 5, pp. 1–30, 3 pls., 1929.

[2] Kirk Bryan, "Glacial Climate in Non-glaciated Regions," etc., *Amer. Jour. Sci.*, 5th ser., vol. 16, pp. 162–164, 1928. Also "New Criteria Applied to the Glacial Geology of Southeastern Massachusetts," *abst.*: Geol. Soc. Amer. Bull., 1932.

[3] G. F. Kay, "Origin of the Pebble Band on Iowan Till," *Jour. Geol.*, vol. 39, pp. 381–385, 1931.

mongrel dog can not be admitted into good canine society. A silk hat must not be worn with any kind of a coat. Every one of refinement is careful to have each article of dress conform to a certain scheme. In the army and navy an officer may on certain occasions wear either all citizen's clothes, or all uniform. He must not wear his uniform cap with a gray sack suit.

The same principle holds true with regard to cultivated taste in the formation of words. Just as one does not generally approve of racial mixtures, so good taste is offended by mongrel words which are the misbegotten offspring of linguistic miscegenation. Doctors seem to be the worst offenders in this matter. They know little or no Greek, but they miss no opportunity to work in what little they think they know in order to mystify or impress. They are devoted, for instance, to hyper and hypo in place of super and sub in composition with Latin stems. All doctors, I am told, say "hypersensitive" and "hypertension." This sounds more learned and is less likely to be understood than supersensitive and supertension. In fact, doctors seem to be quite "hyperstitious" about Greek and somewhat "hypercilious" in the use of it.

But some mixtures are admissible. Greek words have been thoroughly naturalized as Latin, and both Greek and Latin words have been admitted into good English society. The ending "ology" is an example. We even have roentgenology. Many are violently opposed to the anti-prohibitionists, but no one objects to the word. The advocates of "Shapometer" may find some comfort in the fact that meter seems to have been adopted as a legitimate English word. Originally Greek, it was first adopted into Latin and we have many Latin stems combined with it. In the metric system we have millimeters as well as kilometers. Then, as signifying an instrument of measurement, we have it in all sorts of combinations. In voltameter and voltmeter the first element is an Italian proper name. We already have speedometer, why not shapometer? People might well be pardoned for using this last combination, provided they will refrain from accenting kilometer on the second syllable.

Many thousands of our boys went to France who had never used the metric system. There they encountered kilometer and naturally made it rhyme with the familiar speedometer. The sad thing is that many scientists have now fallen into this error. Soon we shall have centimeters and millimeters accented in the same way. But one is not easily surprised at any departure from linguistic orthodoxy when a learned scientist in your columns not long ago aired his learning by saying grandly "cacodorous" and "polyvalent" for the perfectly nice words "malodorous" and "multivalent."

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ACADEMIC FREEDOM IN SPAIN

DR. NONIDEZ' reply to my letter of April 15 is a typical example of "it depends on whose ox is gored." The case of nine Italian professors out of over twelve hundred who are forbidden to teach in state universities because they refuse to take an oath of allegiance to the state is an attack on academic freedom; the case of perhaps twelve hundred Spanish professors who are forbidden to teach in private schools because of a fictitious vow is not an attack on academic freedom.

I too received part of my education in Spain and know conditions there, but I had the good fortune to have been born and reared in the United States which is a republic in fact and not merely in name. I agree with Dr. Nonidez that "the suppression of the Jesuits with the advent of the new order was a foregone conclusion," but not for the reason he assigns. The Jesuit fourth vow has nothing to do with allegiance to a foreign power. It has a very specific object, and one only, and that is to go on the missions when commanded by the Pope as head of the Church. That this vow was a pretext to cover a gross injustice is shown by the fact that, unlike the communists of whom the writer speaks, the Jesuits were not deported as they should have been had they vowed allegiance to a foreign power, but only deprived of their right to teach and hold property.

The fact that the Jesuits were formerly exiled, even by "His Most Catholic Majesty, Charles III," is no excuse for "less severe" treatment by a so-called republican government.

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DURABLE FILMS

THE Aristogenic Association is engaged in making records of the characteristics of men thought to be of great service to humanity. An endeavor is being made to make the records as objective as possible, *i.e.*, to present their own evidence. Therefore the motion picture, photograph and x-ray are extensively employed. Since it is desired to preserve a copy of these records intact for release at the end of a century, they must be durable. There is, however, some doubt as to the best methods of preserving them for so long a time. The usual sources of information are indecisive.

We should appreciate any useful data or suggestions.

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