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.