names except when they had been validated by a binomial author.

I have rejected the names in the catalogue called the Museum Calonnianum, because it is anonymous, and because it was not issued by any named publisher, though we know it to have been based on a manuscript of Hwass and distributed by George Humphrey.

I have not found that accepting the international code in its full meaning and intention has isolated me from the majority of active workers in the line of my specialty. On the contrary, nearly all those who have had much experience with nomenclatorial matters have, like myself, with some reluctance, arrived at the conclusion that half measures will not do, that a thorough revision is the only way to arrive at permanency, and that each of us must do his share toward this desired result.

Wm. H. Dall

U. S. National Museum

P. S.—In order to make sure that my understanding of the rules is correct, I have applied to the secretary of the International Committee on Nomenclature, whose reply is appended.

Dr. Wm. H. Dall,
Smithsonian Institution,
Washington, D. C.

My dear Dr. Dall:

Referring to your letter relative to the points raised by Dr. von Ihering in regard to Article 25 of the International Code, I would invite your attention to a recent opinion rendered by the Commission, namely:

"*The meaning of the word* 'indication' *in Art.* 25a.—The word '*indication*' in Art. 25a is to be construed as follows:

"(A) with regard to *specific* names, an '*indication*' is (1) a bibliographic reference, or (2) a published figure (illustration), or (3) a definite citation of an earlier name for which a new name is proposed.

"(B) with regard to *generic* names, (1) a bibliographic reference, or (2) a definite citation of an earlier name for which a new name is proposed, or (3) the citation or designation of a type species.

"In no case is the word '*indication*' to be construed as including museum labels, museum specimens or vernacular names."

This opinion seems to cover the point of principle under discussion. It does not of course cover the point whether the particular authors mentioned by Doctor von Ihering are to be interpreted as coming under the principle in question. This latter point is dependent upon evidence, but I do not understand that you have asked me to express an opinion on the evidence.

Very truly yours,

C. W. Stiles,
Secretary, International Commission on Zoological Nomenclature

Washington, April 27, 1908

A NOTE ON THE ECOLOGICAL FORMATIONS OF PITTSBURG AND VICINITY

It has occurred to the writer, after reading a recent article in Science,[1] that a generalized classification of the vegetation of Pittsburg and vicinity, as presented recently before the Biological Section of the Pittsburg Academy of Science and Art, might be of interest to many botanists, especially teachers, who may be situated in regions whose land forms are similar to that of Pittsburg or whose vegetation may be classified in a similar manner.

Pittsburg is situated in a region whose soils are quite uniform so far as their chemical composition is concerned, being mainly derived from sandstones and shales, with a few thin strata of limestone, and it takes but little field work to convince one that the all-important factor in the formational structure of the vegetation is to be found in the different conditions of ecological habitats as brought about by physiographic processes. For this region, physiography, in the narrow sense of the term,[2] furnishes an efficient basis for an ecological classification of the vegetation; the details, but not the principles, of classification differing from those of "physiographic ecologists" elsewhere.

The main features of land form which need

[1] Ramaley, Francis, "Plant Zones in the Rocky Mountains of Colorado," Science, N. S., 26:642–643, November 8, 1907.

[2] Geomorphology—that part of physical geography, devoted to the form of the land—coordinate with oceanography and meteorology. See Davis, W. M., "Current Notes on Land Forms," Science, N. S., 25:70–71, January 11, 1907.

to be mentioned in this connection are briefly as follows: The tops of the main hills constitute remnants of an old Tertiary peneplain, now forming a horizon line at about 1,200–1,250 feet above the sea. This peneplain was elevated and dissected by drainage systems and, at the beginning of the Glacial Period, an advanced stage in the cycle of dissection had apparently been reached with wide valleys and graded streams, the latter being about 300–350 feet below the level of the old peneplain, in the Pittsburg region. The drainage system at that time consisted of the "Old Monongahela System," the outlet to which was towards the north to the present basin of Lake Erie.[3] With the blockading of this outlet by ice during the Glacial Period an outlet for this drainage system was effected westward and the Ohio River was formed, and, evidently associated with certain elevations of the land in this region, the drainage system was rejuvenated. This new cycle of dissection has now progressed in the region of Pittsburg to a stage marked by well-developed flood plains in the larger valleys at altitudes of about 720–750 feet above the sea, and about 200 feet lower than the flood plains which were built up during the Glacial Period, or soon after, on the old pre-Glacial valley floor. In the smaller tributaries, however, the streams are still engaged in actively cutting out a lower channel, the narrow recently-formed channel, often a gorge, being usually encountered in the upper third of the stream, while above this point the little streams are still flowing in approximately the same graded channels occupied by them during the existence of the Old Monongahela System.

The more important ecological habitats, as determined by their physiographic origin, and the corresponding ecological plant formations, are briefly as follows:

A. The tops and uppermost slopes of the hills, altitude of 1,050 feet or more above the sea, with a rather thin and infertile soil, are typically characterized in the vicinity of Pittsburg by the *Quercus alba* forest formation. As one stands upon one of the higher hills, this forest, easily recognized by its facies, the white oak, can be seen to comprise all that is left of the natural climax forest around the horizon.

B. Old valleys at the headwaters of the smaller streams of this vicinity, approximately remnants of the Old Monongahela System, at altitudes of not much less than 1,000 feet A.T., usually higher; soil somewhat deeper, more fertile, and more largely transported. This habitat is almost invariably occupied, in undisturbed positions, by the *Fagus-Acer* forest formation, the facies being *Fagus americana* Sweet and *Acer saccharum* Marsh., the beech consocies, however, being more important and often occurring almost pure in limited areas.

C. The narrow ravine or gorge with more or less vertical sides, as brought about recently and being continually extended at the end by the erosive activities of the rejuvenated streams; dark, damp, cool and rocky; elevation about 950–975 feet A.T., usually somewhere in the upper third of the smaller "runs." This habitat is occupied almost invariably by the *Tsuga canadensis* forest formation, the facies being the hemlock, *Tsuga canadensis* (L.) Carr. The transition from this forest formation to the *Fagus-Acer* formation is often as abrupt as is the change in the character of the habitats, neither formation being able to successfully invade the other without a corresponding modification of the habitats through physiographic processes.

D. The flood plains and terraces of the main rivers and, to some extent, continuations of these terraces into the lower parts of the tributaries, of the Old Monongahela System. This is the "900-foot terrace" of which considerable areas are still in existence in Pittsburg and vicinity. The soil is a deep, fertile, gravelly alluvium, usually so situated as to be well drained. This habitat is well characterized by the *Quercus velutina-Q. coccinea* forest formation, the facies being the black and scarlet oaks, respectively, the black oak consocies being the most important. This formation is considerably more dense and exhibits much more prominent layers than

[3] Leverett, Frank, "Glacial Formations and Drainage Features of the Erie and Ohio Basins," U. S. Geol. Survey, Monograph 41:88–100, 1902.

does the first-mentioned *Quercus alba* formation.

E. Talus slopes, at the foot of which are the flood plains of the modern larger rivers and tributaries; soil largely derived from other habitats by landslides, thus usually deep and more or less mixed with rock fragments. The upper part of this habitat, and often the newer or more unstable portions down to the base, is chiefly characterized by what may be termed the *Sambucus pubens* talus thicket formation; facies, the red-berried elder. In the lower portion of the habitat and in the more stable portions this formation is displaced, often plainly *succeeded,* by the next forest formation to be characterized.

F. The present flood plain of the modern rivers and larger tributaries; altitude of about 750–775 feet A.T.; soil a deep, sandy, moist, fertile alluvium. So far as can now be determined this habitat was formerly occupied by a climax *Acer-Ulmus* forest formation; facies—*Acer saccharinum, Acer rubrum, Ulmus americana.* This formation, as indicated by a few isolated remnants, was characterized by a greater number of tree species than any of the other forests of the region. Many large sycamores in this forest are to be regarded as relicts of the next formation.

G. The river banks and low islands subject to inundation during times of floods, especially in winter and spring. This habitat is characterized by the *Platanus-Salix* river-bank forest formation; facies—*Platanus occidentalis* L., and *Salix nigra* Marsh. With the meandering of the stream the habitat often is occupied by the *Acer-Ulmus* forest formation but the sycamores remain as relicts even after the succeeding forest has reached maturity.

H. The sand bars in the rivers, ordinarily covered by shallow water. This habitat is preeminently characterized by the *Dianthera americana* sand-bar formation; facies, *Dianthera americana* L. With the upbuilding of the bar this formation is succeeded by the *Platanus-Salix* river-bank formation.

Besides the above-mentioned formations there are several less conspicuous formations and no mention has been made of various successional formations, especially those of secondary successions incidental to the march of civilization, the purpose of this note being merely to designate the more important plant formations and to point out their correlation with certain conspicuous habitat-structures evolved in the physiographic development of the region.

Otto E. Jennings

Carnegie Museum

The "Permanent Phase"

For some time it has been generally admitted that all substances are capable of existing in the three phases, solid, liquid, vapor, and some substances, as sulphur, in four phases. We believe that all substances are capable of existing in four phases, and some in more.

To show this notion, we will use the common text-book phase-diagram for water shown in Fig. 1, in which, for the sake of clearness,

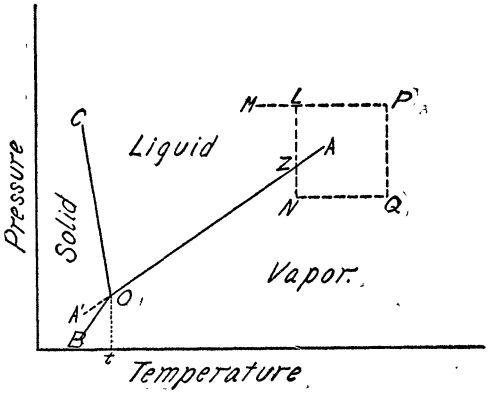

Fig. 1

the curves have been drawn as straight lines, and only the substance in a stable condition is considered. It will at once be seen that OA is the curve of vapor pressure that separates the region of liquid from the region of vapor. However, there is a limiting pressure beyond which the vapor pressure of the liquid can not rise, and therefore at the value of critical temperature and critical pressure A the curve OA abruptly ceases. It is commonly admitted that "for temperatures and pressures beyond A there is no distinction