is seldom as great as fifty per cent. of the total number capable of development.

At any time during the growth of the gametophyte, development may be arrested. Many megasporangia fail to renew their growth in the spring following the dormant period of winter. In *Pinus nigra* var. *austriaca* soon after the beginning of the second growing season the megagametophyte of abnormal sporangia takes on the form of a hollow sphere very much in appearance like a Volvox colony. In the process of disintegration the free cells of this abnormal gametophyte press out toward the margin of the vacuole and there assume the parietal position. These gametophytes never develop archegonia. It is possible that a person limited to material of one season may happen on abnormal ovules with the free nuclei of the gametophyte in a parietal position and later in the season he may obtain normal material with archegonia and gametophyte in a central position. From such a combination of abnormal and normal materials centripetal growth of the gametophyte might be inferred.

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PAUROPODA IN ALASKA

I HAVE been studying small and somewhat obscure arthropods of several widely separate groups, but with a number of features in common. They have no wings, they have no eyes and they live in decaying vegetable material under logs or stones or in humus. In the insect groups I have collected Campodea, Japyx and Protura. Among the centipede-like forms I have searched for Symphyla and Pauropoda.

Members of all these delicate, white, eyeless forms may all occur in one environment, but it is more common to find but one group represented in one place. I have collected from the eastern United States to the western and from Cuba and Mexico to central Alaska. The two insect genera mentioned above and Symphyla are by far the easiest to find. Pauropoda may be obtained by the funnel method or by more direct collecting in the field, but I have never found Protura except with a funnel. I did not use this apparatus in Alaska last summer, and I am not surprised that I did not find any Proturans by the methods used. They may be there; I have not really made a very serious attempt to find them. For the other groups I searched hours in a number of widely separated localities in Alaska, British Columbia and Yukon Territory and found not a single representative of any of the more easily collected animals. The only group obtained in these northern regions was Pauropoda. These were found in but four places. None were collected in southern Alaska. At Skagway several were obtained with mites, Collembola and some other insects. They were under stones in a dense wood. In comparing these with other previously collected specimens I found their nearest relationships were with some obtained the year before well up towards the timber line on Mt. Hood, Oregon. At Dawson City I was especially successful in obtaining Pauropoda. It was a slightly rainy day, moisture conditions on the ground were just right, and I was able to obtain quite a number of specimens. They were about one half way up the mountain back of Dawson City. Next at Eagle, Alaska, a few specimens were found in the woods about a mile from the Yukon.

During several days I searched in the McKinley National Park, and although mites, small centipedes and Collembola were encountered no Pauropoda were seen at any time. It may have been too damp, as heavy rains came frequently.

At Currie a few more of these minute eighteen-legged forms were found. All but one of the four lots encountered were of the genus Stylopauropus, those from Eagle alone were of the genus Pauropus. In fact more than nine tenths of all the specimens collected were of the genus Stylopauropus. In general to the southward Pauropus is more often encountered than the other.

So far as I know this record is the first for these arthropods in Alaska and so far as I have been able to learn these must be farther north than those reported from the old world. But not finding these small animals is no sure proof that they may not be present in a region. It is very easy to overlook them, as indeed all the other forms mentioned, but if one is collecting one particular kind of animal he is apt to find those which were not conspicuous. I have now collected these Pauropoda from the eastern United States, from Mexico both north and south and now from Alaska. I did not find any in Cuba, although I searched in many places.

The species found differ but little from each other, rather minor characters separate them into species. Records from others as well as those of my own suggest a world-wide distribution of two genera.

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MORE ABOUT CITATIONS

SOME comments received since the article "A uniform scheme for citations" was printed (SCIENCE, April 10, 1931, pp. 390–392) indicate the desirability of a few additional notes.

The U. S. Geological Survey scheme is applicable not only to footnote citations but to bibliographic or

other lists of publications and to synonymy. A chronologic list may be printed with the date at the beginning of each citation, as stated, or with each date centered over all the citations that belong to it. In synonymy, as the workers in any one field of biology are relatively few, an author's surname is usually adequate for identification, and for this reason it is customary to omit the author's initials unless they are needed to distinguish two authors having the same surname.

The rule in the Geological Survey citations is to change Roman numerals to Arabic figures, with the single exception of page numbers. In some publications Roman pagination is used for the preliminary matter (title page, table of contents, etc.) and the main text starts with Arabic 1, so that a publication may have, for example, both page xii and page 12. Obviously Roman page numbers can not safely be changed to Arabic in a citation. (In passing it may be said that any good reason for using the cumbersome Roman numerals in the original publications, except for the preliminary pages, would be hard to find. They are especially objectionable as used for plate numbers. "Plate CCXXXVIII," for example, is not only hard to read but occupies much space. In a publication with many plates the space saved by using Arabic numerals would be an item worth considering. It is time the Roman numerals were abandoned.)

In citing a paper contained in a serial publication the title of the paper should be included, as well as the title of the serial. A citation that gives merely the title of the serial affords no adequate clue to the subject of the paper cited and consequently does not indicate whether or not consultation of the paper itself would be desirable for a reader who wishes to pursue the subject further.

Although in citing a paper in a journal whose numbers are paged consecutively in each volume it is not necessary for certain identification to include the number (as "vol. 18, No. 3"), it is a convenience, in referring to journals that have not yet been bound, to know the particular number that contains the paper cited—that is, it may save turning over several numbers until the right one is found. This added convenience may justify the space occupied by including the number in the citation.

The page numbers given in a citation should be those containing the particular matter to which reference is made. For example, in citing an authority for a specific statement the pages on which the statement is to be found should be given—not the pages covering the whole article. Most bibliographies, however, are intended to cite complete articles or publications and should therefore give the limiting page numbers, or, for a separate publication, the total number of pages, in the form "484 pp." A bibliography recently submitted gave only the first page of the article for each citation, which, although enough information to enable any one to find the article cited, gave no clue to the length of the article—an item which might have an influence on the decision whether or not to consult it.

Where questions of priority are involved, as in descriptions of new species, the date given at the end of the citation may include the month and day of publication—if ascertainable—as well as the year. The exact date may be difficult or impossible to determine, except for a serial publication that appears at regular intervals. For other publications even a date printed on the publication itself may not be absolutely reliable, as the printer must guess it in advance, and circumstances may invalidate his guess.

Since the publication of the original article the U. S. Geological Survey scheme has been adopted by the National Bureau of Standards. The obvious advantages of uniformity would seem to recommend it to other publishing scientific organizations.

BERNARD H. LANE,
Editor

U. S. GEOLOGICAL SURVEY

VISION, AND VASCULARITY OF THE EYE

WITH the cooperation of a number of colleagues, I have made a study of the correlation of the sense of vision with the vascularity of the eye, of which this is a preliminary report. Though it is generally recognized that gross alterations in the vascularity of the retina is associated with variation of vision, it has been assumed that these variations are predicated upon damage of the retinal and choroidal tissues. It has been known, for instance, that thrombosis of the retinal artery, with resultant hemorrhages in the retina, results in loss of vision. Our study indicates, however, that there is a quantitative relation between the varying vascularity of the eye and its resultant nutritional status, and the sense of vision.

This study was suggested by parallel work on the vascularity of the ear recently published by me, and the desire to determine what effect the method utilized for altering the vascularity of the ear, galvanization, might have upon other tissues and organs of the head. In subjects with normal eyes it was not found possible to materially alter vision except by the "make" and "break" of the current, due to the rich vascularity of the eye; though it was found possible in many cases to check vision and create a sensation of "blackness" by pressure upon the carotid arteries. In cases in which the vision and the vascularity of the eye were materially reduced by disease process,