ments might be made to advantage; for instance, ice storms should be associated with sleet instead of with dew and frost; and percolation perhaps belongs with the relations of precipitation and vegetation to water supply and stream flow, rather than to the section of atmospheric precipitation. This classification is less complete, but more easily remembered than the International; and, being more recent than either the International or the Dewey systems, it meets in a satisfactory way the general requirements of modern meteorological literature.

Mr. Robert Seyboth has compiled a valuable list of the "Serial Numbers of Weather Bureau Publications."[11] The numbers begin with 60 in 1895 and end with 560, the *Monthly Weather Review* for July, 1915. The list embraces the vast majority of Weather Bureau publications, and, in addition, the important unnumbered publications are mentioned.

Professor A. J. Herbertson died July 30, 1915, at the age of 50 years. He is noted in meteorology particularly for his contribution, "The Distribution of Rainfall Over the Land," compiled for the Royal Geographical Society in 1900, and for his editorship of the Oxford Wall Maps.

Mr. Walter G. Davis, director of the Oficina Meteorologica Argentina for more than 30 years, has retired on a pension. Mr. George Wiggin, a native of New Hampshire, for 21 years assistant director, is now acting director.

Charles F. Brooks

Yale University,
January 3, 1915

SPECIAL ARTICLES

THE DEVELOPMENT OF THE PHYLLOXERA VASATRIX LEAF GALL

In Bulletin 209, recently issued by the United States Department of Agriculture, entitled "Testing Grape Varieties in the Vinifera Regions of the United States," Husmann makes the following statements, p. 12:

> The number of swellings, nodosities and tuberosities from insect punctures and the rotting of the root occasioned by them progress more or less rapidly and deeply in accordance with the texture and character of the root attacked. The weakening and ultimate death of the vine are determined by the extent of the punctures and the progress of the rot upon the roots.

Although Cook suggested that puncturing may be the stimulus for the gall production occasioned by the aphids, no evidence has ever been presented to confirm this theory. To the contrary, after intensive study of the grape-vine leaf gall produced by this insect, the writer has gathered evidence showing that so little puncturing is done by the insect that, as a gall-producing stimulus traumatic puncturing may be regarded as playing a very minor part. Histological sections of leaves attacked by *Phylloxera* readily reveal the actual puncturing done by the insect. This manifests itself in the broken-up condition of the epidermal and mesophyll cells through which the proboscis has passed. In a considerable number of slides, microscopic examination shows the proboscis itself passing through the punctured and broken-up cells. The writer has never found more than two or three epidermal cells and as many mesophyll cells thus ruptured. So slight a disturbance can not be looked upon as the main cause of such large hyperplastic growths as are produced on the leaves of the vine or on the roots of the vine. This view is substantiated by Cornu's excellent work upon the root swellings induced by the attacks of this insect.

The one thing that is definitely certain about the work of *Phylloxera* is the fact that it obtains its food by means of a sucking action. This action usually continues for about 12 to 15 days at one particular point on the leaf, and around this point, which may be called the sucking center, the gall develops. During this time the insect has obtained enough food to enable it to sustain itself, to increase its bulk considerably, and to produce several hundred eggs. The withdrawal of so much food at one point from tender growing leaves, the subsequent changes in tension and pressure at this point, and certain structural peculiarities of the gall itself, all suggest the

[11] *Mo. Weather Rev.*, July, 1915, pp. 346–350.

sucking action as the initial stimulus for gall production.

HARRY R. ROSEN
U. S. NATIONAL MUSEUM

THE QUARTER-CENTENNIAL ANNIVERSARY OF THE OHIO ACADEMY OF SCIENCES

THE twenty-fifth annual meeting of the Ohio Academy of Science was held at the Ohio State University, Columbus, on Friday and Saturday, November 26 and 27, 1915, under the presidency of Professor J. Warren Smith, of Columbus.

Owing to the anniversary character of the meeting the usual program of volunteer papers was replaced by a series of invited addresses, as follows:

Presidential Address, "Agricultural Meteorology," Professor J. Warren Smith, United States Weather Bureau, Columbus.

"Applied Meteorology and the Work of the Weather Bureau," Dr. Charles F. Marvin, Chief United States Weather Bureau, Washington, D. C.

"The Relation of the Academy to the State and to the People of the State," Dr. T. C. Mendenhall, Ravenna.

"Historical Sketch of the Ohio Academy of Science," Professor William R. Lazenby, Ohio State University, Columbus.

Reviews of Scientific Progress in the Quarter Century:

"Geology," Professor Frank Carney, Denison University, Granville.

"Botany," Professor Bruce Fink, Miami University, Oxford.

"Physics," Professor Frank P. Whitman, Western Reserve University, Cleveland.

"Zoology," Professor Edward L. Rice, Ohio Wesleyan University, Delaware.

"Chemistry," Professor William McPherson, Ohio State University, Columbus.

"Archeology," Professor G. Frederick Wright, Oberlin College, Oberlin.

At the supper, held on Friday evening at the Ohio Union, short addresses were given by visiting delegates from other scientific societies. Governor Willis had expected to be present and to speak, but was unavoidably prevented at the last moment.

Notice was received of the appointment of the following delegates; those marked with the asterisk were present at the meeting.

American Association for the Advancement of Science,
*Professor L. O. Howard, Washington, D. C.
Boston Society of Natural History,
*Professor Frederick C. Waite, Cleveland, O.
Chicago Academy of Science,
Dr. Frank C. Baker, Chicago, Ill.
Indiana Academy of Science,
*Dr. D. W. Dennis, Richmond, Ind.
Mr. E. B. Williamson, Bluffton, Ind.
Iowa Academy of Science,
*Professor Herbert Osborn, Columbus, O.
Dr. Charles R. Keyes, Des Moines, Ia.
New York Academy of Science,
Mr. Emerson McMillin, New York City.
Professor H. P. Cushing, Cleveland, O.
Academy of Natural Sciences of Philadelphia,
Dr. Howard Ayers, Cincinnati, O.
Washington Academy of Sciences,
*Professor Dayton C. Miller, Cleveland, O.
*Dr. Charles F. Marvin, Washington, D. C.
Cincinnati Section of the American Chemical Society,
Dr. Lauder W. Jones, Cincinnati, O.
Dr. Alfred Springer, Cincinnati, O.
Cincinnati Society of Natural History,
Dr. DeLisle Stewart, Cincinnati, O.
Columbus Audubon Society,
*Professor J. C. Hambleton, Columbus, O.
Miss Lucy Stone, Columbus, O.
Denison Scientific Association,
*Dr. George Fitch McKibben, Granville, O.
*Mr. Charles W. Henderson, Granville, O.
Wooster University Scientific Club,
*Mr. Frank H. McCombs, Wooster, O.
The Cuvier Press Club,
Mr. James W. Faulkner, Cincinnati, O.
Association of Ohio Teachers of Mathematics and Science,
*Professor S. E. Rasor, Columbus, O.
Ohio State University Scientific Association,
Professor Karl D. Swartzel, Columbus, O.
*Professor James R. Withrow, Columbus, O.
Oxford Science Club,
*Professor J. A. Culler, Oxford, O.
Otterbein Science Club,
*Mr. Richard M. Bradfield, Westerville, O.
Baldwin-Wallace Science Seminar,
*Professor E. L. Fullmer, Berea, O.

The following members of the old Tyndall Association, so potent in the scientific life of Columbus and Ohio in the seventies and eighties, were also present by special invitation:

Mr. H. N. P. Dole, Columbus, O.
Mr. Martin Hensel, Columbus, O.