during one or more comparatively early stages of the Pleistocene ice from the north advanced over the Columbia Plateau in a southwesterly direction far beyond what heretofore has been regarded as the southern limit of glaciation. The evidence at hand tends to show that the ice extended at least over large parts of Spokane, Lincoln and Adams counties, and less complete information suggests the possibility that the glaciation extended much farther.

Concerning the glacial drift, which by the way is not the only evidence the region affords that land ice was formerly present, the alternative ideas that it was brought to place by floating ice or running water have been considered and rejected. Large patches of the drift may be seen southwest of Cheney, west of Lantz, and in the neighborhoods of Winona, Lacrosse and Kahlotus, these occurrences being selected for mention at random and not because they are more typical than scores of others scattered throughout the region.

The writer wishes to point out that he does not herein attempt to correlate or otherwise define the relations between the glaciation described and the glaciation already known to have covered the plateau west of the Grand Coulee or an ice stream which, as shown by recent observations, traversed the coulee itself.

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## EFFECTS OF COPPER WIRE ON TREES

IN 1918 the writer heard it stated that shade trees were being killed by driving one or two pieces of copper wire into each. To test the effects of copper wire six young trees from two to four inches in diameter were selected, and on March 21, 1919, there were driven into each tree five pieces of large copper wire 1.5 inches long. The end of each wire was left flush with the outer surface of bark. All wires were within six feet of the base of the tree. The trees comprised two hemlocks, two alders, one cedar, one willow.

On July 3, 1922 the trees were examined and found to be perfectly healthy. In all cases they had completely healed over the wires, and their growth was equal to that of other similar trees in the immediate vicinity. On cutting into the trees, it was found that there was very little injury to the wood, merely a brown color showing for about 1.5 inches above and below the wire, and about 0.25 inch to each side.

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## TANGENT LINES

OSGOOD and Graustein state in their *Analytic Geometry,* page 176: "A tangent to a conic might then be defined as the limiting position of a line having two points of intersection with the conic, when these points approach coincidence in a single point." This accords with the ancient idea of a tangent as touching a conic at only one point. That idea is given in a paragraph on page 163 of my *History of Mathematics,* from which Professor G. A. Miller quotes[1] part of a sentence and then criticizes that part. I illustrate this mode of criticizing by quoting from Professor Miller's review the following: "Students can usually prove a large number of theorems which they do not understand." Serious-minded readers would deny this statement, but when they read the whole sentence and the paragraph from which this fragment is taken, they will acquiesce.

FLORIAN CAJORI

## SCIENTIFIC BOOKS

*A Treatise on the Analysis of Spectra.* By W. M. Hicks, Sc.D., F.R.S., emeritus professor of physics in the University of Sheffield, formerly fellow of St. John's College, Cambridge. Cambridge University Press, 1922, 231 pp. of text, 92 pp. of tables and 25 figures.

The purpose of the book is twofold, to serve as an introduction and handbook and to present the mature results of the author's extensive investigations. The treatise is based on an Adams prize essay presented in 1921. For the first purpose the appendix contains the Meggers and Peters tables for corrections to be added to the wave-lengths in air to reduce

[1] This Journal, October 13, page 421.