the relief (whether contouring, hachuring or shading).

A number of corollaries follow, a few of which will be cited:

Elimination of units too small for delineation should proceed by order of magnitude. In a consistent map units of a certain order should not appear in one place and be omitted elsewhere.

Elimination of units of one order should not result in the enlargement of those of a higher order. The delineation of the latter, in order to be expressive, should so far as possible *suggest* the presence and character of the detail suppressed.

Consecutive reductions in scale should carry with them elimination of correspondingly higher orders of units.

In conclusion, it may be stated that the practical application of these principles by the topographer in the field proves to lead to no revolutionary changes in mapping methods, but on the contrary confirms the soundness of the practise, intuitively established though it may be, for the most part, of our ablest modern cartographers.

Ralph Arnold,
Secretary

Discussion and Correspondence

Geological Climates

To the Editor of Science: Dr. Lane, in his interesting paper published in Science for April 10, urges certain readers not to accept my "*ipse dixit*" but rather to await further promised demonstration.

With the added evidence given in the last issue of Science (pp. 784–5) it seems hardly necessary to point out that, so far as theories relating to terrestrial phenomena are concerned, it now rests solely with the scientists to demonstrate, if possible, that some vital flaw exists in my published work; so long as this can not be done, "most modern theories of geological climate" must certainly be regarded as "upset," *for these theories are based upon an adopted value for the temperature of space which is* (according to my demonstration) *too great by nearly three hundred degrees of the centigrade scale* at the earth's distance from the sun; and this result is practically independent of the errors of observation, for even if we should assume the measured focal temperature to be one thousand degrees in error, the provisional value (1°.5) for the temperature of space would be altered only a degree or so.

My result for the absolute temperature of space is not a speculative one; until it is proved incorrect it must stand as a demonstrated fact which is in no way dependent on other demonstrations to be given "later on."

It may not be out of place to remark that by attaching too much importance to the occasionally unguarded assertions of great authorities we are apt to retard, or to discourage, original work along lines still demanding rigid investigation. That a purely empirical formula like Stefan's should, by common consent, be honored to the extent of being called a "law," is misleading; that one of our great living authorities should refer to "The establishment of Stefan's law"[1] is still more misleading.

For myself, the most remarkable feature of this whole controversy is the fact that it has escaped the attention of scientists that, on purely theoretical grounds, the results deduced with the aid of Stefan's formula (or any other formula except the Newtonian) can not be in agreement with the principle of the conservation of energy.

J. M. Schaeberle

Ann Arbor, Mich.,
May 18, 1908

"Amethystine Blue."

To the Editor of Science: On page 825 of Science, May 22, 1908, Professor T. D. A. Cockerell calls attention to the development of the color of amethyst in glass exposed to strong light, and also mentions that this color is discharged by heat.

I am writing this brief note to call attention to the fact that the phenomena mentioned in Professor Cockerell's communication have long been known to chemists, and the explanation of same is very simple, viz., bottle glass is usually made of cheap raw materials,

[1] Science, March 27, p. 503.